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# A CATALOG OF DEPARTMENT OF DEFENSE MEDICAL MODELS AND SIMULATIONS

## Version 2

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## **EXECUTIVE SUMMARY**

### **Problem**

Information about Department of Defense medical models and simulations is available from many different sources. The Internet, in particular, is a rich source of data, but searching the Web can be time-consuming. Although information is available, it is often difficult to locate, and, once found, is often outdated. The Joint Services Medical Readiness Modeling & Simulation Advisory Group (JSMRSAG) recognized this problem early in 1997, and in conjunction with the Naval Health Research Center (NHRC), compiled the Catalog of Department of Defense Medical Models and Simulations. That document was distributed on both the JSMRSAG and NHRC Web pages, as well as in hard copy and on disk. The initial effort alleviated the problem of finding the information; now, a year later, that information must be updated.

### **Objective**

The goal of the present effort is to update the Catalog of Department of Defense Medical Models and Simulations that was compiled in 1997.

### **Approach**

The Point of Contact (POC) for each project listed in the Catalog was contacted to determine if any changes had occurred. The original information was forwarded to the POC by e-mail or Fax, and the POC returned the information with appropriate updates. Extensive Internet searches also provided data.

### **Conclusions**

Version 1 of the Catalog of Department of Defense Medical Models and Simulations provided a centralized location for information about these specialized projects. Version 2, in the interest of responsible Internet communication, proposes to keep this information current by providing timely updates of Modeling and Simulation (M&S) projects.

# CATALOG OF DEPARTMENT OF DEFENSE MEDICAL MODELS AND SIMULATIONS Version 2

## ***Introduction***

Modeling and simulation (M&S) is a growing field with many applications. The words “model” and “simulation” often are used interchangeably, but in fact, their definitions differ. According to the Department of Defense Directive Number 5000.59 of January 4, 1994 (DoDD 5000.59), a model is defined as *“a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.”* DoDD 5000.59 defines a simulation as *“a method for implementing a model over time. Also, a technique for testing, analysis, or training in which real-world systems are used, or where real-world and conceptual systems are reproduced by a model.”* Models and simulations are used to predict, to teach, to train, to plan, and to demonstrate, to name just a few of their applications. M&S applications range in complexity from text-based output to virtual reality simulations.

A cursory search for M&S projects on the Internet yields more than forty home pages in the military alone. Most of the indexed military M&S applications are simulations of operational situations involving equipment such as cockpits, weapons, tanks, and other hardware. Information about *medical* M&S projects is more difficult to find. The military medical community has developed numerous models and simulations, but often these projects are listed as sub-topics, or are indexed by title. Therefore, researchers are caught in a tautology: in order to *find* information about DoD medical models and simulations, they need to *have* information such as the name of the project, the point of contact, or the developer.

As models and simulations become increasingly important to the DoD medical community for use in resource planning, casualty estimation, and patient care, it is desirable to develop a resource for current information about them. This project has been undertaken to locate and catalog DoD medical models and simulations with capabilities ranging from casualty estimation to medical logistics planning to simulations of patient encounters. The goal is to collect this specialized information, place it into a single source, and simplify access to it.

## ***Version 1 Review***

The initial catalog evolved from three main sources. A draft catalog of medical models and simulations compiled by the Henry Jackson Foundation provided a comprehensive list of existing projects. The Army Medical Department Center & School at Fort Sam Houston also produced a catalog of computer models that yielded several additional projects, as well as the data form used in this project. Other entries came from the Internet. The data from these sources was often taken verbatim; when this occurred, the specific source was given at the bottom of the page for that entry. If the Internet was the source, the Internet address was provided.

The Internet search became, in effect, a sub-study. Forty-three sites of interest to DoD medical researchers were found. Examples included a glossary of military terms, various search engines, a “white pages” list of M&S personnel, various publications, calendars of M&S demonstrations and meetings, and M&S home pages for each branch of the DoD as well as the Joint Chiefs. The addresses of these Web sites were displayed in Appendix A.

The Catalog of Department of Defense Medical Models and Simulations, an alphabetical listing of 53 individual medical M&S projects, comprised Appendix B. The document was distributed by Internet on both the NHRC and the JSMRSAG Web sites. In addition, JSMRSAG distributed a limited number of hard copies of the Catalog, with an accompanying disk that could be used to perform electronic searches.

### *Version 2*

The Points of Contact (POCs) were asked to provide updated information about their projects. If an initial contact and several follow-up communications yielded no results, an Internet search was used to find the current status of the projects. These findings, in the form of the Catalog of Department of Defense Medical Models and Simulations, appear in Appendix B.

Appendix A contains links to other DoD sites. The links in Version 1 quickly became outdated because the Internet changes so rapidly. Therefore, this list has been abbreviated to include only major links.

Version 2 will be distributed through the Internet. Because it is an NHRC Technical Document, it will appear on the **Error! Bookmark not defined.** Web Page. The **Error! Bookmark not defined.** Web Page will also publish the Catalog. There will be no hard copy available for distribution; however, the document can be downloaded from the Web.

Updates will be made as they are received. To make changes to a current project, or to add a new one, contact Eleanor Gauker by e-mail at **Error! Bookmark not defined.**, or by phone at (619) 553-8412, DSN 553-8412.

### *Summary*

The need for a specialized catalog of DoD medical models and simulations becomes evident when one attempts to uncover information on this topic without the benefit of having personal contacts in a professional network. The information is *there*, but it is very difficult to discover *where*, because it is scattered among various sources.

When searching the Internet, one quickly learns that a great deal of the information found there is outdated; however, organized, well-maintained sites are useful resources. So that this catalog continues to be a timely resource, points-of-contact may provide updated information or additional projects at any time. In addition, it will be necessary to actively pursue updates to the information for each project at least on a yearly basis to keep up with changes in the field of medical modeling and simulation.

## **APPENDIX A**

### **Useful Internet Sites**

## Internet Sites

The Federal Web Locator	Error! Bookmark not defined.
Naval Web Sites	Error! Bookmark not defined.
BuMed	<b>Error! Bookmark not defined.</b>
Surgeon General	Error! Bookmark not defined.
Naval Research Lab	Error! Bookmark not defined.
Virtual Naval Hospital	Error! Bookmark not defined.
Marine Corps	Error! Bookmark not defined.
Army Home Page	Error! Bookmark not defined.
JSMRSAG	Error! Bookmark not defined.
Defense Link	Error! Bookmark not defined.
Joint Chiefs	Error! Bookmark not defined.
DARPA	Error! Bookmark not defined.
Health Affairs	Error! Bookmark not defined.
M&S Resource Repository	Error! Bookmark not defined.
Joint Warfighting Center	Error! Bookmark not defined.
Army M&S Catalog (WWW Version)	Error! Bookmark not defined.
Army M&S Catalog (AMSCAT)	Error! Bookmark not defined.
Army Research Institute for Environmental Medicine	Error! Bookmark not defined.
Air Force M&S	Error! Bookmark not defined.
M&S Website Directory	<b>ERROR! BOOKMARK NOT DEFINED.</b>



**APPENDIX B**

**A CATALOG OF DEPARTMENT OF DEFENSE**

**MEDICAL MODELS AND SIMULATIONS**

**Version 2**

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## PROJECTS LISTED BY BRANCH OF SERVICE

### *Air Force*

APSE Automated Patient Stream Estimator  
CASE Casualty Stream Estimator (CaSE)  
CHAS Chemical Hazard Assessment System  
CWTSAR Chemical Warfare Theater Simulation of Air Base Resources  
HQ AMC AE  
MEDTRAN  
MRPF  
MRSD Medical Readiness Support Database  
NET EDIT Network Edit  
SMRTS Standardized Medical Readiness System (SMRTS)  
THREAT Threat Related Attrition System  
UTC UTC (Unit Type Code) Validation Mode

### *Army*

AURA Army Unit Resiliency Analysis  
BBS Brigade/Battalion Battle Simulation  
CASRED Casualty Reduction Analysis  
CASSTRAT Casualty Stratification Model  
CBS Corps Battle Simulation, Version 1.5.4  
CEM Concepts Evaluation Model  
COSAGE Combat Sample Generator  
CSSTSS Combat Service Support Training Simulation System 1.5  
FASTALS  
FST Forward Surgical Team (FST) Simulation  
GREWMS Global Requirements Estimator for Wartime Medical Support  
HCM Healthcare Complex Model  
JANUS  
MEDEVAC Medical Evacuation Simulation  
MOBCEM Mobilization Capabilities Evaluation Model  
PATGEN Patient Workload Generator  
PFM Patient Flow Model  
TRANSMO Transportation Model  
VIC Vector In Commander

### *Marines*

CASEST Casualty Estimation Model

### *Navy*

AIMM Automated Interactive Medical Multimedia  
FORECAS  
MARC-ES  
NHRC MAT  
OPTEVAC  
SHIPCAS  
SHIPDAM Ship Damage Model

***Other Department of Defense***

JCATS      Joint Conflict & Tactical Simulation      Joint Warfighting Center

JOPES      Joint Operation Planning & Execution System Defense Systems Support

Organization

LPXMED      External Logistics Processor, Medical Module Joint Staff/J4-Medical Readiness

Division

MAT      Medical Analysis Tool      Joint Staff/J4-Medical Readiness Division

MEDISIM      Simulated Medical Corpsmen for Medical Forces Planning and Training

DARPA

MERLIN      Medical Readiness Learning Initiative      OASD/HA & OASD/RA

ORCA      Operational Requirements-based Casualty Assessment Software System

JTCG/ME&AS

<b>NAME OF MODEL:</b>	<b>AIMM-AUDIOVISUAL INTERACTIVE MEDICAL MULTI-MEDIA</b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Bureau of Medicine &amp; Surgery (BUMED)</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Naval School of Health Sciences 8901 Wisconsin Ave., Bldg 141, Room 120 Bethesda MD 20889-5611</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Judith A. Goldman, AIMM Head Phone: DSN 295-5594; COM (301) 295-5594 FAX: DSN 295-6019; COM (301) 295-6019 E-mail: <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>ADL for Navy and Tri-Service medical personnel</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Interactive MULTIMEDIA training for medical topics</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Mouse and keyboard &amp; WWW</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Interactive MULTIMEDIA training programs including full-screen 30 fps motion video and stereo audio.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Systems described at <b>Error! Bookmark not defined.</b> When DVD-ROM programs are distributed, multimedia computer specifications will be described at <b>Error! Bookmark not defined.</b></li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Multimedia training programs, on CD-ROM, DVD-ROM, videodisc, and the World Wide Web.</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Distributed Disks contain complete documentation.</li> <li>Web site, <b>Error! Bookmark not defined.</b></li> <li>Visual Information Manager's Guidebook</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Conducted at program conclusion</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>15 to 30 minute segments contained on one to ten hours disks.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>Varies according to site from constant to infrequent. Systems are distributed worldwide.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>Deployable Medical Forces, hospital corps first responders, etc.</li> </ul>

<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Current courseware includes: <ul style="list-style-type: none"> <li>• “Management of Chemical Warfare Injuries” (084039)</li> <li>• “ACTLS”</li> <li>• Malaria</li> <li>• Derm</li> <li>• Psy Tech</li> </ul> </li> <li>• Future courseware includes: <ul style="list-style-type: none"> <li>• “Biological Warfare Injury Management: Cardiac Catheterization” (804796)</li> </ul> </li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Navy, interactive multimedia, CD-ROM, DVD-ROM, simulation, medical, health care</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <b>Error! Bookmark not defined.</b></li> </ul>

<b>NAME OF MODEL:</b>	<b><i>AUTOMATED PATIENT STREAM ESTIMATOR (APSE)</i></b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Development completed.</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• USAF Surgeon General Office</li> <li>• Directorate, Medical Readiness Doctrine &amp; Planning</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• Human Systems Center, Human Systems Program Office, Medical Information &amp; Simulation Systems Division (YAI)</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Col Sarah Wright, (301) 619-7503</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• APSE is used to generate representative air base attack casualty streams based on wartime environments to allow evaluation of wartime medical systems and assemblages.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• APSE is a software program that generates casualty streams based on a specific scenario and wounded in action rates.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Default Population Histogram</li> <li>• Patient Condition Mapping</li> <li>• Default Wartime Disease Non-battle Injury (DNBI) Multipliers</li> <li>• Battle Injury Histogram</li> <li>• Major ICD-9 Histogram</li> <li>• Minor ICD-9 Histogram</li> <li>• Slight DNBI Deployable Medical System (DEPMEDS) Patient Condition (PC) Histogram</li> <li>• Battle Reaction Stress (BRS) Histogram</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Run Identification Data</li> <li>• Scenario Data</li> <li>• Wounded in Action Rates</li> <li>• Travel Freeze Time</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Patient Stream File</li> <li>• Attack File</li> <li>• Documentation File</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Battle Injury Casualties limited to those resulting from Air Delivered Conventional Weapons</li> <li>• Maximum Population at Risk Limited to 8,000</li> <li>• Casualty Streams limited to DEPMEDS PCs</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• 486DX/33 or higher</li> <li>• 500 Kbytes, minimum</li> <li>• 3.5", 1.44 MB</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Microsoft Disk Operating System 6.2</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• APSE Reference Manual, including User's Instructions and code listing</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• No formal Validation or Verification has been accomplished.</li> </ul>

<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"><li>• As required.</li></ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"><li>• Unclassified, but certain databases may be classified.</li></ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"><li>• As required</li></ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• HQ USAF/SGXR, WAR-MED Planning Systems Office</li></ul>
<b>MISCELLANEOUS:</b>	
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• War-Med, Air Force, casualty streams, analysis, planning, modeling</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• HQ USAF/SGXR, WAR-MED Planning Systems Office</li></ul>



**NAME OF MODEL:** *AURA-ARMY UNIT RESILIENCY ANALYSIS*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• Director, US Army Research Laboratory, ATTN.: AM&amp;SRL-SL-CM, Chemical, Biological, Nuclear, and Environmental Effects Division, Aberdeen Proving Ground, MD 21005-5066.</li> <li>• <b>Error! Bookmark not defined.</b></li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• US Army Ballistic Research Laboratory, Aberdeen Proving Ground, MD 21005-5066</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Matthew B. Kaufman, COM (410) 671-3958, DSN 584-3958, e-mail: <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• The AURA model may be used both as a research and evaluation tool and an operation support tool. Its primary outputs consists of personnel and unit equipment losses, identification of weak links within the unit structure, and unit effectiveness. As a research and evaluation tool it has been used extensively to study the effectiveness of weapon systems against targets and could be applied to the problem of assessing the most effective mix of munitions types against particular targets. It has also been used as a tool to assess the impact of TO&amp;E force structure changes on a unit effectiveness. It provides the flexibility to model the effects of cross-training and the various methods of task accomplishment which make it applicable for use in resource planning. As an operations support tool, the model has been used to generate casualty assessments in support of field operations. The model has also been used to provide information for field training exercises to drive Th. synchronization of replacement support decisions.</li> </ul>

<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• AURA is a one-sided, fully automated, event-sequenced model. Quantification begins with the definition of capabilities needed for a unit mission. These capabilities are vested in the various personnel and equipment with full, user-definable, multi-capable elements allowed. Personnel and equipment are deployed including identification of nuclear as well as conventional posture. Weapons are employed using Monte Carlo techniques to portray target location errors. Casualties and damage are assessed for both nuclear and conventional threats using current techniques. Then, at realistic times during the engagement, the unit assets are reallocated and redeployed to optimize mission performance capability. Options include a comprehensive, asset competitive repair/return-to service capability, reliability, dynamic posture changes, and secondary casualty effects.</li> <li>• Domain: land</li> <li>• Span: Local</li> <li>• Mission areas represented: indirect artillery, bombs, rockets, missiles, and smart munitions.</li> <li>• Level of detail: Individual soldiers and equipment</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Standard and alternate mission performance procedures;</li> <li>• Unit composition and deployment;</li> <li>• Elemental capabilities; degradations and repair</li> <li>• Threat (acquisition, warhead delivery, warhead types);</li> <li>• Vulnerability/lethality information</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Time-step and event-step; progresses through events at user-specified times.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Effectiveness vs. time</li> <li>• Weak link (limiting capability) analysis</li> <li>• Casualty/damage reports</li> <li>• Operating procedure reports</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• M. Smith, "Review and Recommendations of AURA for CORPSAM," US Army Research Laboratory, April 1997 (DRAFT).</li> <li>• M. Kaufman, ARL-TR-1404, "Nuclear, Biological, and Chemical Contamination Survivability (nBCCS): Reliability, Availability, and Maintainability (RAM) – The Forgotten Casualties of War," US Army Research Laboratory, June 1997.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Mainframe: CDC, DEC, VAX, IBM, and CRAY</li> <li>• RAM/Disk storage: 12 MB</li> <li>• Printer</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• C++ programming language</li> </ul>

<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Executive Summary: BRL-MR-3892</li> <li>• User manual: BRL-TR-3187</li> <li>• Programmer manual: Vol 1-BRL-TR-3156, Vol 2-BRL-TR-3103</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• not specified</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Running time not specified</li> <li>• Time to prepare: 3 man-months</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• Upon request</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Army Research Laboratory SAIC TRAC-WSMR TRAC-FLVN</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Model output supports chemical casualty estimates for the TRADOC Decision Support System and field manuals. Has been examined for linkage to FORCEM and VIC.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Personnel losses; Equipment losses; Chemical casualty estimates</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• Matthew B. Kaufman, COM (410) 671-3958, DSN 584-3958, e-mail: <b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *BBS-BRIGADE/BATTALION BATTLE SIMULATION*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Director, Combined Arms Command-Training</li> <li>National Simulation Center</li> <li>Fort Leavenworth KS 66037-7301</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>National Simulation Center</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>POC: LTC Loughhead, Tactical Division Chief, DSN 552-8132; Comm (913) 684-8132; Fax (913) 684-8137; E-Mail <a href="mailto:loughhej@leav-emh.army.mil">loughhej@leav-emh.army.mil</a>.</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>BBS provides battalion and brigade commanders and their staffs with an environment in which to train for the execution of AIRLAND battle doctrine at the tactical level of war. BBS is used primarily as a Command Post Exercise (CPX) driver.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Two-sided, free play, real-time environment</li> <li>Plays air and ground warfare between opposing units and the resupply, medical, and maintenance needed to support the conflict.</li> <li>High resolution</li> <li>Represents weapon and support system at the item level.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Terrain databases, loaded to hard drive by CD</li> <li>Unit-dependent scenarios/unit databases.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Movement/conflict orders</li> <li>Unit names and locations</li> <li>Resupply</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Conflict resolution</li> <li>Battle damage</li> <li>Personnel and logistics losses</li> <li>Alerts, reports, graphic battle description</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Limited to play terrain types available as digitized data with video disk display</li> <li>Can only model up to 750 units (red and blue inclusive)</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer system: Digital Equipment VAX/VM&amp;S</li> <li>RAM/disk storage: 32 Meg Ram/5 hard drives 426 megs each/5 external hard drives 426 each</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>MODULA-2</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Executive Summary</li> <li>User Manual: Warfighters Guide &amp; Commanders Planning Guide</li> <li>Programmer Manual: Database Managers Guide and System Managers Guide</li> </ul>

<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Verification proponents: National Simulation Center (NSC), Communications and Electronics Command (CECOM). Simulation Training and Instrumentation Command (STRICOM)</li> <li>• Validation proponents: NSC, CECOM, STRICOM</li> <li>• Configuration management proponents: NSC, CECOM, STRICOM</li> <li>• V &amp; V performed: Software/hardware</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 3 weeks to prepare databases &amp; scenarios</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Battalion and Brigade Command and Staff</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Can now create terrain areas in a few weeks given the appropriate ADRG map data by NIMA, or the organization requesting exercise support.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Model, battalion, brigade, simulation</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <u>Error! Bookmark not defined.</u></li> </ul>

**NAME OF MODEL:** *CASUALTY STREAM ESTIMATOR (CASE)*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Under Development</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• USAF Surgeon General Office</li> <li>• Directorate, Medical Readiness Doctrine &amp; Planning</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• USAF Surgeon General Office</li> <li>• Directorate, Medical Readiness Doctrine &amp; Planning</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Col Sarah Wright, COM (301) 619-7503; DSN 343-7503</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• The Model generates theater (local and evac-in) casualty stream.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• The Model produces reports that contain Time of Arrival, Time of Injury, Time of Last Care, Patient Identification, DEPMEDS Patient Condition, Number of casualties, Type of Casualty (BI, NBI, DIS, BS), Evac Transportation, Last Level of Care, Patient Location Coordinates.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• DEPMEDS Patient Conditions Data</li> <li>• Major Type Cluster Data (BI, NBI, DIS, BS)</li> <li>• PC Frequency Distribution</li> <li>• Survival Curve Data</li> <li>• Major ICD-9 Code Histogram</li> <li>• Minor ICD-9 Code Histogram</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• PAR (Population-at-Risk) Data</li> <li>• Population Distribution Parameters</li> <li>• BI, NIB, IDS, BS Rates per 1000</li> <li>• Conflict Intensity Period Data</li> <li>• Distance, speed, and location parameters</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Casualty Streams Report</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• IBM compatible PC Pentium</li> <li>• Minimum of 8 MB RAM</li> <li>• 75 MHz processor clock frequency</li> <li>• Minimum 20 MB disk space (more required for user data)</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• C/C++</li> <li>• Windows 95</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Completed.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• TBA</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Minimal time to prepare scenarios (30 minutes)</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified, but some databases may be classified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand</li> </ul>

<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• HQ USAF/SGXR WAR-MED PSO</li></ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• Operates Independently.</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Casualty, Scenario, PAR, C++, Analytical, Model, Frequency, Distribution, Probability, Statistics</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• WAR-MED PSO, Fort Detrick, MD</li></ul>

<b>NAME OF MODEL:</b>	<b>CASEST</b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Headquarters, U.S. Marine Corps. Code MPP-60</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>IDEAMATICS, Inc.</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>MAJ Max Waugh, COM (703)-614-1358, e-mail: mwaugh@notes.hqi.usmc.mil</li> <li>Dr. David L. Danner, COM (703) 903-4972, e-mail: <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>To provide manpower planners with estimates of scenario-based battlefield casualties</li> <li>To stratify estimated casualties by type casualty, by period, and by grade and military occupational specialty</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>CASEST is a deterministic model for projecting total casualties and personnel replacements at an operational level of detail.</li> <li>Estimates address DNBI, Nuclear, Chemical/Biological and conventional casualties.</li> <li>Estimates segregate casualties by combat element (ground, aviation, and combat service support).</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Billet information on deployed units</li> <li>Casualty rate database</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Scenario-specific factors describing combat operations including forces at risk, combat intensity, geographical area, medical evacuation policy, aircraft sortie rates and weapons lethality.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Tabular reports of estimated casualties by casualty type and by date, time, phase, force deployed or in total.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Estimates casualties for conventional and NBC warfare scenarios, but is not currently calibrated for Operations Other Than War.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: IBM compatible 286+</li> <li>Storage: 500 KB RAM, 1.5 MB disk</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Clipper compiled dBase</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>User Reference Manual</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Marine Corps Command Development Center Study, 11/91</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>10 days of simulation per second.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>On demand</li> </ul>



<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• CMC, Code MPP</li><li>• USMC force commanders</li></ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• Model is executed during operation of USMC Manpower Mobilization Assignment System</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Casualty projection, WIA, KIA, DNBI, casualty rates, USMC, DOW, replacements</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• Danner, D.L., Casualty Estimation (CASEST) Model User Reference Manual, IDEAMATICS, Inc., McLean, VA, December 31, 1997, Version 3.3.</li></ul>

**NAME OF MODEL:** *CASRED - CASUALTY REDUCTION ANALYSIS*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>US Army Materiel Systems Analysis Activity</li> <li>Aberdeen Proving Ground, MD 21005-5071</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>US Army Materiel Systems Analysis Activity</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Mr. Stanley C. Butler, COM (410)278-3175; DSN 298-3175</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>This model can be used either by munitions designers or by designers of armor and helmet protection for soldiers.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>CASRED models either a bullet, or fragments from an infantry munitions, to determine the extent to which they penetrate the target soldier's armor, helmet, or uniform and produce specified types of casualties.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Fragmentation data exist for a number of munitions.</li> <li>Presented area tables for standing and prone targets</li> <li>Casualty criteria</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Human participation: this is a closed, physical model.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Summaries of fragmentation data</li> <li>Lethal area values by casualty criterion and body part</li> <li>Probability-of-kill (pk) as function of range</li> <li>Pk by body part and for entire body</li> <li>Pk as grid for input to stochastic models such as fbar</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Physical space is limited by the farthest range at which fragments from the burst have enough remaining velocity to produce casualties.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: 486/33 PC</li> <li>RAM/Disk storage: 8 MB RAM, 200 MB storage</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Fortran</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>User Manual includes model description, Input Guide, and Guide to Output Options. Available from POC.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Not provided</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>Preparation of fragment data for actual munitions requires arena testing</li> <li>Preparation of target presented area tables for new desired postures requires photography and measurement.</li> <li>Preparation of casualty criteria for new subdivisions of body parts requires expert medical opinion</li> </ul>

<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"><li>• Source code &amp; documentation: Unclassified</li><li>• Some fragmentation data may be confidential or secret</li></ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"><li>• On demand</li></ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• Army Materiel Command</li><li>• Vendors for product evaluation</li></ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• In process of phase-out; working to confer same capabilities on the Joint Technical Coordinating Group(JTCG) project "Mean Area of Effectiveness Against Personnel Targets."</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Casualty, fragmentation, model, simulation</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• <b>Error! Bookmark not defined..</b></li></ul>

**NAME OF MODEL:** *CASUALTY STRATIFICATION MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Stanley Miller</li> <li>COM (301) 295-5292; DSN 295-5292</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>This model is a computerized, deterministic model which provides a means of predicting, by skill category and grade, the casualties from a war scenario.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>This one-sided, deterministic model deals primarily with forces at a theater level. Its primary function is to take a statement of aggregate casualties on a time-phased basis, usually 210-day increments, and stratify or disaggregate those casualties into MOS/grade levels, also time-phased Theater level campaign simulations generate casualty estimates. These estimates are grouped at the echelon and branch level. Within the individual branch levels, casualties are distributed to the MOS/grade level based on the branch population density.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Population-at-risk (time-phased) by MOS/grade</li> <li>Casualties (time phased)</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Theater-level campaign simulation data collected at brigade level.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Report of MOS/grade losses over time</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Vulnerability/loss rates are theater and scenario dependent, assume that casualties include KIA and MIA only and are extremely time consuming to develop.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: SPARC-IPC</li> <li>Operating system: SUN OS4.1</li> <li>Peripheral equipment: 1 8mm tape drive, 1 laser printer</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Programming language: ANSI FORTRAN</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Available at US Army Concepts Analysis Agency</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Not given</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>2 days to structure data in model input formats once other simulations have been completed.</li> <li>5 minutes CPU time</li> <li>Minimal learning time</li> <li>Minimal time needed to analyze and evaluate results</li> </ul>

<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"><li>• Unclassified</li></ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"><li>• 5 times per year</li></ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• US Army Concepts Analysis Agency</li></ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• The Casualty Stratification Model operates as one component in a series of casualty projection models developed by the Concepts Analysis Agency.</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Model, simulation, MOS, casualties, vulnerability</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• <b>Error! Bookmark not defined.</b></li></ul>

**NAME OF MODEL:** *CBS - CORPS BATTLE SIMULATION, VERSION 1.5.4*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>National Simulation Center, 410 Kearney Ave, Fort Leavenworth KS 66027-1306</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Combat Developer - National Simulation Center</li> <li>Materiel Developer – Simulation Training &amp; Instrumentation Command (STRICOM)</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>David Sargent, COM (913) 684-8155, DSN 552-8155</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>CBS is the Corps/Division command and staff trainer in the Army's Family of Simulations (FAM&amp;SIM). Its primary use is as a CPX driver for large-scale Army and Joint Exercises. One of its main uses is by the Battle Command Training Program (BCTP) in the conduct of Corps and Division Warfighters to train corps, division, and brigade staffs. CBS is the ground model in the Joint Training Confederation, which is used in large-scale joint exercises.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: Land and air combined arms combat</li> <li>Span: Theater &amp; Corps Area of Operations</li> <li>Mission areas represented: all elements of air-land battle including conventional and tactical nuclear combined arms warfare, indirect fire, close air support, battlefield air interdiction, airlift, maintenance, supply, and medical operations.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Direct fire combat results are determined by use of weapon-on-weapon Lanchester attrition calculations, supplemented by the expert system, Combat Outcome Based on Rules for Attrition (COBRA).</li> <li>Available databases/scenarios: SW Asia, expanded Europe, Western Europe, Central Europe, Bosnia, Philippines, Korea, North Japan, South Japan, Cuba, Nigeria, Algeria, SWUSA, Lantica, and Atlantis.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Terrain Database</li> <li>Unit Database</li> <li>Systems Database</li> <li>Close combat data</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Military graphics overlaid on variable scale maps displayed on color vdts</li> <li>Orders, spot reports, and other output for controllers and training audience are output on dot matrix printers and to files.</li> </ul>

<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Unit limitation of between 15,000-20,000 units, depending on speed of computer used.</li> <li>• No naval or amphibious play.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer system: a network of one central processor (VAX 7620) and several Microvacs 3140</li> <li>• Ram/disk storage: 256 mb RAM for central processor and 16 meg RAM for each micor Vax</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• SIM&amp;SCRIPT II.5, C, OPS 5 expert system language</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• A complete set of documentation for CBS 1.5.4 was published by the Jet Propulsion Lab. This includes the Executive Summary, User Guide, Analyst Guides, etc.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• National Simulation Center performs V &amp; V of each model version.</li> <li>• STRICOM performs configuration management of the model.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Several man-years to collect and enter complete data base set.</li> <li>• Several man-weeks for moderate changes to force structure</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand, used for approximately 10 WFX's and 5 JTC exercises each year. Additionally, used on demand by the Corps Battle Simulation Centers.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• All army Divisions, Corps, MACOMS</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• CBS is considered a legacy model and is in the maintenance mode. It will be replaced by WARSIM in a few years.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Combat model, WFX, simulation, ground combat, Corps, Division.</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *CEM - CONCEPTS EVALUATION MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>William T. Allison</li> <li>DSN: 295-5236; COM: (301) 295-5236;</li> <li>FAX: DSN 295-5517; COM (301) 295-5517</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>CEM is used primarily to analyze force effectiveness at theater level warfare. It is designed to provide a tool to asses the effectiveness of different mixes of forces and resources and to estimate Force Capability, Force Requirements, and Munitions Requirements.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: Combat, Land and air.</li> <li>Span: Accommodates any theater given a database. Simulates up to 400 days of conventional linear theater warfare.</li> <li>Mission areas represented: Command &amp; Control, Fire Support, Brigade-level combat</li> <li>Level of detail: simulates command decisions at four levels from theater to division.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>CEM Data Management System</li> <li>Available databases/scenarios: Korea, Central Europe, SW Asia for 1999, 2001, 29003; Ardennes Campaign, 1944</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Does not model breakthrough, airborne assaults, engineer functions, transportation, lines, of communication, electronic, chemical, or nuclear warfare.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer system: Cray XM-P/48; CRAY 2; CRAY YM-P, IBM RS-6000, PC-586</li> <li>RAM: 1.4 million decimal words. Disk: 3 gbytes</li> <li>Peripherals: two tape drives or disks, one printer</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>ASCII FORTRAN</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>User Manual, Technical Description Manual</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency. Sensitivity tests; simulation of historical battle (Ardennes Campaign, 1944)</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>Time to prepare databases/scenarios:</li> <li>Acquisition - 2 months; preparation - 2 man-months</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>



<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"><li>• On demand</li></ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• USA CAA; Korean Institute for Defense Analysis; Republic of Korea Army Staff</li></ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• Fully automated deterministic combat model. Requires combat attrition data from high level model.</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Combined arms, combat simulation, command and control, theater combat</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• <b>Error! Bookmark not defined.</b></li></ul>

**NAME OF MODEL:** *CHAS - CHEMICAL HAZARD ASSESSMENT SYSTEM*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>AS/CFHD, Wright-Patterson AFB</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>JAYCOR, Dayton Ohio under USAF contract to AL/CHFD, WPAFB</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Dr. C.R. Replogle DSN: 785-7583; COM: (513) 255-7583</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>CHAS was developed in support of the SALTY CHASE Command Post Exercise in USAFE as a tool for hazard analysis, response training and hazard management for USAF bases. CHAS performs the following functions:</li> <li>Allows user to examine various chemical attack scenarios, to construct strategies for defense detector layout, and to plan postattack air base reconstitution</li> <li>Provides user with postattack status of air base personnel and material</li> <li>Provides user information on various aspects of chemical hazards.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: land</li> <li>Span: local</li> <li>Environment: facilities with data base information, population centers, weather conditions</li> <li>Scope of conflict: air base operations and vulnerability</li> <li>Level of detail: chemical munitions delivery by missile, bombs, artillery. Casualties are reported for all population centers.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Chemical munitions effects data base, model parameters (e.g., Agent data: physical constants, agent toxicity, equipment protection factors, detector thresholds)</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Scenario development: attack profile, target profile, weather profile, detector profile (optional), population profile (optional)</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Graphic display of chemical contamination, hardcopy plots of target area, casualty reports and casualty streams, detector status reports, building damage</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Produces discrete "snapshots" of chemical challenge; personnel are stationary throughout the scenario; weather conditions are assumed constant for the duration of the chemical threat.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer (OS): UNIX, XENIX, AIX</li> <li>Storage: 4 MB memory, 40 MB hard disk</li> <li>Peripherals: VGA monitor, mouse, printer (optional) and plotter</li> </ul>

<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Fortran 77, gks</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• User Manual, Programmer Manual</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Not provided</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Or more man-hours to digitize basic target from facilities map</li> <li>• Chemical munitions effects data base generated off-line at 15-20 minutes per case</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• Weekly</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• JAYCOR, AL/CFHD and HSD/YA (USAF), DRES (Canada), NRDEC (US Army), Saudi Arabia</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Air Force, analysis, chemical hazards, casualty stream</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *COSAGE - COMBAT SAMPLE GENERATOR*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Director, U.S. Army Concepts Analysis Agency</li> <li>ATTN: CSCA-SS, 8120 Woodmont</li> <li>Avenue, Bethesda, MD 20814-2797.</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>John W. Warren, DSN: 295-1690; COM: (301) 295-1690. FAX DSN 295-5517; COM (301)295-5517</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The principal application is the forecasting of personnel, ammunition and equipment requirements to determine Force Capability and Force Requirements. It is intended to provide division-level killer/victim scoreboards for calibration for the ATCAL (Attrition Calibration) algorithm.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: land and air</li> <li>Span: division area of operations</li> <li>Mission areas represented: most mission areas associated with conventional combined arms are represented except for logistics and intelligence</li> <li>Level of detail: Maneuver unit resolution is typically down to Blue platoons and Red companies. In the case of close combat, resolution is to the level of individual equipment or personnel and their weapons, with each direct fire shot modeled explicitly.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Various European, Korean, SW Asian scenarios are available.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Unit organizations, strength and weapons; orders for each maneuver unit, weapons data, sensor capabilities, terrain parameters, movement rates, artillery organization and characteristics.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Killer-victim scoreboard, personnel losses, ammunition expenditures by shooter/target combination, materiel losses, and unit locations on plot by time.</li> <li>Graphical display of unit locations</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Electronic, biological, chemical, and nuclear warfare are not modeled, nor military operations in built-up areas. Logistics and intelligence functions are not represented.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer system: IBM RS-6000 with AIX; also UNIX or VAX/VM&amp;S</li> <li>Storage: 6 MB memory to run, 3 MB disk for model and input data, 10 MB disk for outputs</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Sim&amp;script ii.5</li> </ul>

<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• COSAGE User Manual, Combat Sample Generator Program Maintenance Manual, and COSAGE User's Manual Input/Output Guide</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• US Army Concepts Analysis Agency</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 6 man-months to acquire data plus 3 man-months to structure data in model input form</li> <li>• 1 man-month to analyze output</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Source code: unclassified</li> <li>• Data: SECRET</li> <li>• Documentation: Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• </li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• US Army Concepts Analysis Agency</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• This is not a true medical model, but provides output that might be of interest to medical planners. The information listed herein was taken directly from the Web site below, and may not be current.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Killer-victim scoreboard, personnel losses, ammunition expenditures</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *CSSTSS - COMBAT SERVICE SUPPORT TRAINING SIMULATION SYSTEM 1.5*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>National Simulation Center</li> <li>Fort Leavenworth KS 66037-7301</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>National Simulation Center, Logistics Exercise and Simulation Directorate</li> <li>Fort Lee, VA 23801-1511</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Mr. Al Damour DSN: 539-1770; COM: (804) 765-1770; e-mail: <b>Error! Bookmark not defined.</b></li> <li>Mr. Joe Riley DSN: 765-1768; COM: (804) 765-1768; e-mail: <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>CSSTSS 1.5 is an exercise driver used to stimulate exercise play for the collective training of AC and RC commanders and staff personnel in command, control and coordination. The training audience includes the CSS commanders and staffs in Echelons Above Corps, Corps, Corps Support Commands, Divisions, and Division Support Commands as well as their subordinate headquarters down to the battalion level. It also trains combat commanders in the use of their logistics support.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Randomness: both stochastic and deterministic</li> <li>Domain: Will accommodate any theater depending on database</li> <li>Mission areas: personnel, aviation, base support, combat service support, command &amp; control, engineering, NBC, ammunition, maintenance, liquid logistics, transportation, mortuary affairs, medical, reception, staging, onward movement and integration (RSOI), support of all conventional land warfare</li> <li>Level of detail: personnel is played to the individual name, grade, and MOS; supplies to the NSN, DODIC level of detail; movement to the Transportation Control Number level, medical tracks patients by wound type, availability of proper medical personnel, operating rooms, blood, Class VIII and evacuation assets, maintenance to the work order level of detail.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>TRADOC SRC database for unit populating</li> <li>European and Korean scenarios and a classified SWA scenario</li> </ul>

<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Unit locations</li> <li>• Supporting-supported relationships</li> <li>• Supply point stockages</li> <li>• Training audience participates by making management decisions</li> <li>• Exercise control group translates decisions into simulation inputs</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Emulated STAMIS reports to training audience</li> <li>• Non-STAMIS reports to exercise control staff</li> <li>• See also Level of Detail under Description.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• This model is designed to track CSS functions down to the Direct Support Unit (DSU) level. It does not track the availability of supplies, ammo, or liquid logistics in combat units.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer system: mainframe IBM 9121.</li> <li>• Storage: 128 MB RAM/60 GB disk space per exercise.</li> <li>• Peripherals: IBM 3490 tape devices</li> <li>• Network: IBM 3745 Type communications controller. DEC channel server</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• COBOL</li> <li>• Special system requirements/libraries: OS/390 and CICS/ESA</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Under development</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• V&amp;V performed during conduct of LOGEX, FPLX, AMEDDEX, and PW exercises.</li> <li>• Proponent: National Simulation Center</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 2-3 months to build and test scenario database</li> <li>• 2 hours to process files and produce STAMIS reports</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• C2 Minimum trusted class; can process up to Secret level</li> <li>• Source code: unclassified</li> <li>• Data: up to and including Secret</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• Typically 10-12 times per year.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• LOGEX 89, 90, 92; FPLX 93; AMEDDEX 91-95; PRAIRIE WARRIOR 94-95; CASCADE STEEL 95; Division AWE 97, Reserve Component exercises</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Linkage to CBS model complete</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• CSSTSS</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *CWTSAR - CHEMICAL WARFARE THEATER SIMULATION OF AIR BASE RESOURCES*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>AL/CFHD, Wright-Patterson AFB</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>JAYCOR, Dayton, OH, under USAF contract to AL/CHFD, WPAFB</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Dr. C. R. Replogle, DSN 785-7583, COM (513) 255-7583</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>CWTSAR is a Monte Carlo discrete event simulation model of air base sortie generation operations in a CW environment for one or more air bases. A simulation consists of multiple trials, each spanning several days of air base operations and representing a complete Blue and Red scenario. CWTSAR incorporates the effects of chemical warfare into the existing framework of the TSAR model (developed by Rand Corp)</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: land</li> <li>Span: local</li> <li>Scope of conflict: conventional and chemical warfare</li> <li>Mission area: air base operations</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Air base descriptors, air base resources, task networks, mission tasking, attack data (resource loss data, runway/taxiway hit lists, chemical challenge history data), chemical warfare factors, miscellaneous simulation data.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Not required</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Primary air base operations measures (sortie generation data, personnel casualty data)</li> <li>Secondary air base operations measures (air base activities summaries, resource constraint data, aircraft maintenance summaries, runway/taxiway availability), raw simulation data</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Extensive data requirements</li> <li>Restrictive work shift representations (12 on-12 off)</li> <li>Limited representation of aircrew operations and air base support processes</li> <li>No individual tracking of aircrews</li> <li>Only tactical aircraft operations simulation</li> <li>No measures of the effectiveness of the sorties flown</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer (OS): UNIX workstation or Windows 95/NT with a Unix command interpreter.</li> <li>Peripherals: none</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Computer (OS): UNIX workstation or Windows 95/NT with a Unix command interpreter.</li> <li>Peripherals: none</li> </ul>



<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Limited</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Not specified</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>Database development: from days to weeks</li> <li>Cpu time per cycle: Unix workstation: 1-4 hours; Pentium 200 with 64 MB RAM: 30-120 min; Pentium 266 with 128 MB RAM: 5-30 min.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>According to contract requirements</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>Simulation Technologies, Inc.</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>Air base operations, sortie generation, chemical/biological warfare, performance degradation</li> </ul>
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li><b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *FASTALS*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Forces Directorate, US Army Concepts Analysis Agency</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Forces Directorate, US Army Concepts Analysis Agency</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>US Army Medical Department Center and School Assistant Commander for Force Integration ATTN.: MCCS-FCC-A Chief, Force Structure and Analysis Branch Fort Sam Houston, TX 78234-6175 Telephone DSN: 471-1746/2985; COM (210) 1746/2985</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The purpose of the FASTALS model is to compute administrative and logistical workloads and to generate the theater level support force structure requirements necessary to round out a combat force in a postulated confrontation. FASTALS may be used in any force planning simulation to develop a force that is balanced, time-phased, and geographically distributed. A troop list is said to be balanced when the individual units comprising the list are capable of accomplishing the various workloads generated by the total force. Troop lists are said to be time-phased when unit requirements are prescribed for each time period in the simulation. Support to combat units is defined as the logistics and administrative service necessary to support a tactical activity. The Major elements of support are maintenance, construction, supply, transportation, hospitalization, and evacuation, and personnel replacement. Requirements for units performing these functions are derived from workloads which are generated as a function of the combat force deployment, theater structure, and the tactical operations as developed in the warfighting model.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>FASTALS is a table driven model, using factoring techniques for the majority of its computations. It is one-sided and requirements oriented and is designed to estimate logistical and administrative workloads in a theater of operations on the basis of the buildup of forces and their levels of activities, or combat intensity, over time. In addition to producing time phased, geographically distributed, support force requirements, FASTALS provides summary level detail on the numerous workloads generated over time, supply consumption and stockage, and noncombat (support) personnel loss estimates.</li> </ul>

<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• The master file, which consists of the data necessary to allocate units and to prescribe unit support requirements.</li> <li>• Additional scenario data includes length and number of time periods, damage factors, WIA and DNBI admission rates, and enemy prisoner of war (EPW) capture rates. Stock status.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Scenario parameters: <ul style="list-style-type: none"> <li>• Combat simulation data.</li> <li>• Geographical depiction of the theater of operations.</li> <li>• Prepositioned equipment.</li> <li>• Prepositioned war reserve materiel stocks.</li> <li>• Engineer support requirements.</li> <li>• Supply data</li> <li>• M-day units.</li> </ul> </li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Consumption.</li> <li>• Construction requirements.</li> <li>• Workload summary (i.e., US Army population, required hospital beds).</li> <li>• Nondivisional personnel losses.</li> <li>• Time-phased troop deployment list.</li> <li>• Transportation analysis.</li> <li>• Branch summary.</li> <li>• Unit tonnage report.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Limitations are primarily due to the complexity of inputs to the Master File and Scenario. All data must be entered in prespecified order and must agree in context via cross reference.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer: Dual 486/66 MHz Processor.</li> <li>• Operating System: SCO UNIX.</li> <li>• Disk space: 20MB.</li> <li>• Peripheral equipment: hard disk, printer.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Programming language: FORTRAN.</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Complete in one manual with narratives and input formats.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• not specified</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• The processing time is directly related to the size of the scenario developed by the planner. At the Directorate of Combat and Doctrine Development, processing time averages about 30 minutes. About two thirds of this time is devoted to input/output operations.</li> <li>• 2 man-days to analyze and evaluate results.</li> <li>• 1 man-week to modify existing data in model input format.</li> <li>• 1 man-month learning time for users.</li> </ul>

<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Concepts Analysis Agency.</li> <li>• Directorate of Combat and Doctrine Development, US Army Medical Dept. Center and School.</li> <li>• US Army Combined Arms Support Command.</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Operates independently or in connection with other medical or nonmedical programs.</li> <li>• KEYWORDS:</li> <li>• Scenario, Master File, Workload, Materiel Transportation, Maintenance, Medical, Personnel, Construction, Force, Troop list, FORTRAN.</li> </ul>
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• AMEDD Catalog of Computer Models.</li> </ul>

**NAME OF MODEL:**                      **FORECAS**

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Naval Medical Research &amp; Development Command</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Naval Health Research Center</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Christopher Blood, DSN 553-8386, COM (619)553-8386</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>To provide medical planners with estimates of the average daily rates of medical admissions during a given scenario</li> <li>To indicate the maximum daily patient loads for which planning is necessary</li> <li>To enhance understanding of the statistical properties of injury and illness rates for use in future modeling efforts</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>FORECAS is a casualty forecasting system</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Historical casualty database from WW2, Korea, Vietnam, Falklands</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Casualty incidence to be projected: DNBI, WIA, KIA</li> <li>Battle intensity: None, Light, Moderate, Heavy, or Intense</li> <li>Categories of troops: Infantry, Support, or Service Support</li> <li>Theater: Specific adversary</li> <li>Length of operation</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Graphical and tabular displays of wounded, killed, and illness incidence for each troop type</li> <li>Statistical summary screen for user-defined parameters</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Not specified</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: IBM or IBM-compatible PC, mouse</li> <li>Peripherals: EGA to SVGA monitor</li> <li>Storage: 1 MB RAM</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Borland 3.1 C++</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Users Guide, Technical Report</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Technical Document 94-2B, Naval Health Research Center</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>Not specified</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>Not specified</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>Casualty rates, casualty estimates</li> </ul>

<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Blood CG, Zouris JM &amp; Rotblatt D. Using the Ground Forces Casualty Forecasting System (FORECAS) to project casualty sustainment. Naval Health Research Center Technical Report 97-39.</li></ul>
<b>SOURCE OF INFORMATION:</b>	

**NAME OF MODEL:** *FORWARD SURGICAL TEAM (FST) SIMULATION*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Directorate of Combat and Doctrine Development, US Army Medical Department Center and School.</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>MAJ Robert Syvertson, ORSA Student, Naval Postgraduate School.</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>US Army Medical Department Center and School Assistant Commander for Force Integration ATTN.: MCCS-FCC-A Chief, Force Structure and Analysis Branch Fort Sam Houston, TX 78234-6175 Telephone DSN: 471-1746/2985 COM (210) 1746/2985</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The Forward Surgical Team model is a computer simulation of the far forward surgical care to be provided by a 20-man team co-located with the Division medical company at Level II. It is used to provide insight and analysis capability on resourcing levels, force structure, and utilization rates and to evaluate the FSTs capability to perform its wartime mission. The user can modify many of the model parameters, including casualty arrival rates, patient category percentages and resource levels.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>The model is a stochastic simulation of far forward surgical care. Primary solution techniques involve probability distributions of patient arrivals and patient types. Treatment is simulated as a function of patient condition. It includes animated displays of the simulation. Statistical summaries are available for resource utilization, casualty data, and workload. The model has options to specify and capture additional output which may be listed or used as input to other models.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Casualty densities for pre-selected patient conditions.</li> <li>Casualty arrival rates.</li> <li>Waiting time thresholds.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Length of simulation.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Operating room utilization.</li> <li>Staff utilization.</li> <li>Casualty waiting times.</li> <li>Casualty processing times.</li> <li>Statistics from multiple replications.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>To be determined. Model is under development.</li> </ul>

<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer: IBM compatible PC, 386 min., and 16MB RAM min.</li> <li>• Operating system: M&amp;S-DOS ver 5.0 or later.</li> <li>• Disk space: 25 MB.</li> <li>• Peripheral equipment: hard disk, printer.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• MedModel simulation software (COTS package).</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• MedModel documentation is complete in two manuals. User and programmer/analyst documentation has not been developed.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• US Army Medical Department Center and School</li> <li>• Assistant Commander for Force Integration</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 10 minutes run time, CPU.</li> <li>• 1 man-day preparation of scenario input data.</li> <li>• 3 man-days analysis and evaluation.</li> <li>• 1 man-day to enter basic patient data.</li> <li>• 5 man-days learning time for user.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• 10 minutes run time, CPU.</li> <li>• 1 man-day preparation of scenario input data.</li> <li>• 3 man-days analysis and evaluation.</li> <li>• 1 man-day to enter basic patient data.</li> <li>• 5 man-days learning time for user.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Office of the Surgeon General, Department of the Army.</li> <li>• Directorate of Combat and Doctrine Development, US Army Medical Department Center and School.</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Operates independently. Long term objective is to build connectivity to other medical models to simulate all or select portions of theater/battlefield.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Analytical, Model, Patient, Health Care, Manpower Utilization, Forward Surgical Team, Computerized, Stochastic, Medical, Simulation, Animation, Replications.</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• AMEDD Catalog of Computer Models</li> </ul>



**NAME OF MODEL:** *GLOBAL REQUIREMENTS ESTIMATOR FOR WARTIME MEDICAL SUPPORT (GREWMS)*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Assistant Commander for Force Integration, US Army Medical Department Center and School.</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Assistant Commander for Force Integration, US Army Medical Department Center and School.</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>US Army Medical Department Center and School Assistant Commander for Force Integration : MCCS-FF Chief, Force Structure and Analysis Branch Fort Sam Houston, TX 78234-6175 Telephone DSN: 471-1746/2985 COM (210) 1746/2985</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>This model was created to incorporate concepts developed during the 1984 Medical System Program Review (M&amp;SPR). It has been improved since that time to use data derived from the DEPMEDS database. The primary purpose of GREWMS is to determine bed requirements by bed type for theater and CONUS hospitals under varying evacuation policies and delays.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>The GREWMS Model was originally developed in July 1984. A data base was developed for operating room times, average stay times, Armed Services Medical Regulating Office (ASMRO) categories, litter/ambulatory condition, and died in hospital percentages for the theater. In August 1985 operating room times and average stay times for CONUS were added. After December 1985 the data was directly correlated to the DEPMEDS data base for bed stays and surgery times. It computes the mix of intensive, intermediate, minimal and convalescent beds as well as total required hospital beds, operating room times, deaths in hospital, and intra- and inter-theater evacuations. For CONUS it computes required military and civilian beds for recovering patients and separate bed requirements for patients to be discharged for disability. Recent improvements permit variable evacuation policies, variable evacuation delays, and separate accounting for treatment of battle fatigue patients in the Combat Reconditioning Center.</li> </ul>

<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• ASMRO category associated with patient condition.</li> <li>• Percentage who die in a hospital.</li> <li>• Operating room times for theater and CONUS hospitals - minutes.</li> <li>• Average stay times by bed type for theater hospitals - hours.</li> <li>• Average stay times by bed type for CONUS hospitals - days.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Patient condition.</li> <li>• Litter or ambulatory status of patient.</li> <li>• Percentage field (currently unused).</li> <li>• Type of CONUS hospital.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Hospital admission reports.</li> <li>• Died in hospital reports.</li> <li>• Hospital operating room reports.</li> <li>• Hospital bed reports.</li> <li>• Evacuation reports.</li> <li>• Return to duty reports.</li> <li>• Disability Discharge report.</li> <li>• MODEL LIMITATIONS:</li> <li>• None specified.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Computer: Dual 486/66 MHz Processor.</li> <li>• Operating system: SCO UNIX.</li> <li>• Disk space: 10MB.</li> <li>• Peripheral equipment: hard disk, printer</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• FORTRAN programming language</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• User and programmer/analyst documentation is complete and contained in one manual. Includes: <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• File descriptions.</li> <li>• Run instructions.</li> <li>• Sample reports.</li> <li>• Program/subroutine descriptions.</li> <li>• Common block dictionary.</li> </ul> </li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Assistant Commander for Force Integration, US Army Medical Department Center and School.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Man-weeks learning time for user.</li> <li>• Man-months to acquire and audit data for a major update.</li> <li>• Man-days to key data in model input format.</li> <li>• Seconds run time.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• On demand.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• US Army Medical Department Center and School.</li> </ul>
<b>PRINCIPAL USERS:</b>	

<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• Model, Deterministic, Hospital, Bed Type, Patient, FORTRAN, Evacuation, CONUS, ASMRO.</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• AMEDD Catalog of Computer Models</li></ul>
<b>SOURCE OF INFORMATION:</b>	

**NAME OF MODEL:** *HCM - HEALTHCARE COMPLEX MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• US Army Medical Research and Materiel Command</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• Vector Research, Inc.</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Dr. George Miller, COM (734) 997-8900, <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• HCM is designed to assess the effects of reengineering healthcare delivery systems, including the addition of telemedicine capabilities, on the ability of patients to access healthcare services (including requirements for travel) and the quality and cost of those services. It is applicable to both deployment and peacetime care scenarios.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• HCM is a Monte Carlo discrete event simulation that models the flow and treatment of patients within a network (or "complex") of facilities of varying clinical capabilities. It uses ICD-9 code based clinical descriptions of patients, assigns specific treatment protocols (represented as a sequence of healthcare services and associated resource requirements) to those patients, and tracks resource utilization associated with the healthcare services. It moves patients throughout the complex according to their need to access clinical resources that are assigned to facilities by the user in scenario construction. HCM allows some resources (e.g, specialist physicians) to be accessed via telemedicine where facilities have been assigned telemedicine capability in the scenario. HCM is data driven and is unlimited in its ability to represent categories and details of patients, clinical protocols, and facility resources.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Case mix distribution</li> <li>• Clinical protocols</li> <li>• Resource requirements for clinical services</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Network description (facilities, inter-facility transportation times)</li> <li>• Population at Risk / Enrollment population by demographic category</li> <li>• Facility preferences for evacuation, teleconsulting</li> <li>• Facility-specific resources (provider mix, ancillary services, surgery, beds, telemedicine capability)</li> </ul>

<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Outputs can be categorized by facility, patient type, patient priority, type of healthcare service, clinical specialty, or other dimensions as required by the user and include:</li> <li>• Utilization of providers, ancillary services, beds</li> <li>• Patient movement patterns</li> <li>• Telemedicine consults</li> <li>• Access to specialty care (timeliness)</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• HCM is data driven and is limited only by the amount and detail of the input data set.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer: Pentium 100 MHz Processor, 32 MB RAM</li> <li>• Operating System: Windows 95</li> <li>• Disk space: 100 MB (varies with input data and run length)</li> <li>• Peripheral Equipment: Printer</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• MedModel 3.5 (HCM 1.0)</li> <li>• Microsoft Access 2.0 (HCM 1.0)</li> <li>• Microsoft Excel 5.0 (HCM 1.0)</li> <li>• Software requirements for HCM 2.0 are to be determined</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• HCM 1.0 Methodology Manual</li> <li>• HCM 1.0 User's Manual</li> <li>• HCM 1.0 Reference Guide</li> <li>• HCM Executive Summary</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• None for HCM 1.0</li> <li>• HCM 2.0 scheduled for V&amp;V in 1998</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 2-4 person-days learning time for basic users (scenario construction excepting clinical protocols)</li> <li>• 2 person weeks learning time for advanced users (complete scenario construction)</li> <li>• Minimum 1 person-week data development for complete scenario construction</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• To be determined</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Operates independently. Part of a planned hierarchy of healthcare simulation models that includes the Healthcare Management Model (HMM). HCM 2.0 scheduled for completion in December 1998.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Model, Simulation, Healthcare, Protocol, Telemedicine, Scenario, Entity-based, Requirements, Planning, Stochastic, MedModel, Treatment</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• Vector Research, Inc., Ann Arbor MI</li> </ul>



**NAME OF MODEL:** *HQ AMC AE*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Development completed.</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>USAF HQ AMC/SGXP</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>USAF HQ AMC/SGXP point of contact:</li> <li>Maj Jim Lorraine, DSN 576-2205</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>The model calculates a strategic, CONUS, and notional theater AE aircraft, AE crew, augmentee, patient movement item, CONUS bed, and CONUS staging bed requirement. (Theater is notional because model can not distribute casualty stream generation across multiple points of a theater and is constrained by current evacuee calculators.)</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The Model was developed between Mar 1994 and Mar 1997. At this point it is considered completed. There have been plans to migrate this methodology to the TRANSCOM Regulating and Command and Control Evacuation System (TRAC2ES). Portions of the patient characterization methodology and output data have been adopted by HQ AF/SG (WARMEDS).</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>The Defense Medical Standardization Board (DMSB) Task Time Treater Files (TTTF),</li> <li>The Services distribution of patients (Probability of occurrence), - HQ AMC's in-flight care requirement for each TTTF,</li> <li>HQ AMC XPY (Studies and Analysis Flight) aircraft capability data - Evacuee streams from either the theater CINC/SG or CJCS J-4 MRD</li> <li>Reported CONUS bed capabilities from the Integrated CONUS Medical Operations Plan (ICMOP) and VA/NDMS bed reporting exercises.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Run scenario Data</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>AE crew, augmentee, patient movement item, CONUS bed, and CONUS staging bed requirement.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Model cannot distribute casualty stream generation across multiple points of a theater and is constrained by current evacuee calculators</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>486DX/33 or higher</li> <li>500 Kbytes, minimum</li> <li>3.5", 1.44 MB</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Microsoft Excel</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>TBA</li> </ul>

<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• No formal Validation and Verification has been accomplished.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Uncertain</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Unclassified, but some databases may be classified</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• On demand</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• HQ AMC USAF/SGXP</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Air Force, analysis, casualty stream, bed requirements, patient movement</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• HQ AMC USAF/SGXP</li> </ul>
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	



**NAME OF MODEL:** *JANUS*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Advanced Concepts Requirements:                             <ul style="list-style-type: none"> <li>Director, US Army TRADOC Analysis Command-White Sands Missile Range</li> <li>TRAC (TRADOC Analysis Center)</li> <li>JANUS Development Division</li> <li>Wargame Directorate</li> <li>White Sands Missile Range, NM 88002-5002</li> </ul> </li> <li>Training:                             <ul style="list-style-type: none"> <li>Director, National Simulation Center</li> <li>USACAC</li> <li>Attn: ATZL-NSC-M</li> <li>Fort Leavenworth KS 66027-5000</li> </ul> </li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Analysis Enhancements: TRAC White Sands</li> <li>Training Enhancements (STRICOM)</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>(ACR) Dr. R. M. Parish, DSN 258-4949, COM (505)678-4949, e-mail parishr@trac.wsmr.amy.mil</li> <li>(Training) MAJ John Donovan, DSN 552-8119, COM (913) 684-8119</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>JANUS is a multipurpose ground combat simulation wargame. It is an interactive, near-real-time model developed to explore the relationships of combat and tactical processes. Types of uses are scenario development, weapon systems performance, test planning, test augmentation, seminars on tactics, techniques, procedures, exercise driver, operations support, combat developments evaluations, tactical commander training and unit training.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: air, land, sea (littoral areas)</li> <li>Span: can accommodate any locale, depending upon data. Battalion, Brigade, and Company combat operations are conducted. Network applications are tailored for specific needs; DIS compliant.</li> <li>Mission areas: conventional and low-intensity conflict.</li> <li>Level of detail: Individual soldiers or individual systems are lowest entities modeled.</li> </ul>

<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Available databases/scenarios: TRADOC Standard High Resolution Scenarios plus locally developed scenarios for training use.</li> <li>• Weapons, sensor, and system performance; weapons, sensor, and system characteristics; terrain, artillery and forces information are required inputs.</li> <li>• user input:</li> <li>• Runscreen parameters; tactical decisions during combat via graphical interface with computer.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Hardcopy output of game statistics, artillery summaries, direct fire reports, range analyses, detection tables, and killer-victim scoreboards. Also provides a graphical replay, graphical statistics and measures of casualties, and rerun capability.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Area fire of direct fire weapons is not assessed, illumination rounds are not played and nuclear phenomena such as dazzle, induced radiation fallout, and EMP effects are not currently assessed. For any given issue, the scope or level of detail may not be sufficient to address.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Computer system: HP workstations with X-Windows and UNIX operating system.</li> <li>• Storage: 128 MB RAM and 2 GB mass storage (HP only)</li> <li>• Peripherals: Tektronix UNIX-X-Window Workstation, one or two graph tablets and pucks per workstation, one printer.</li> <li>• Network: Ethernet or UNIX system, T1, ISDN, DSI, depends on sites connected.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• FORTRAN 77 and C.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• User Manual, Database Manager's Manual, Release Notes</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Verified and Validated during numerous COEAs, continuous feedback from users.</li> <li>• Proponents: TRAC and STRICOM</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• 2 weeks to create new database and check it</li> <li>• 2 days when only modifications are needed</li> <li>• Study results usually available in 1 to 6 weeks</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Code is unclassified; databases may be classified</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Daily</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• Numerous US military users; Australia, France (2 sites), Germany, Canada, United Kingdom, Korean Institute for Defense Analysis</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• In process of updating documentation</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Wargames, Interactive, Stochastic, Multi-sided, Entity-based, Network applications</li> </ul>

<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• <b>Error! Bookmark not defined.</b></li></ul>

<b>NAME OF MODEL:</b>	<b>JCATS - JOINT CONFLICT AND TACTICAL SIMULATION</b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Scheduled Delivery March 1998</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Joint War Fighting Center (JWFC), Fort Monroe VA 23651</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Conflict Simulation Laboratory (CSL) at Lawrence Livermore National Laboratory (LLNL).</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>LTC Dan Snyder, DSN 680-6430; COM (757) 726-6430; e-mail: <a href="mailto:snyder@jwfc.js.mil">snyder@jwfc.js.mil</a></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The Joint Conflict and Tactical Simulation (JCATS) is a multi-sided, interactive, entity level, joint conflict simulation. JCATS capabilities will include the ability to conduct Joint Task Force level exercises across the entire spectrum of war, to include Operations Other Than War and highly specialized operations. JCATS is the result of a merge between the <b>Error! Bookmark not defined.</b> (JTS) and the <b>Error! Bookmark not defined.</b> (JCM). It will contain the important capabilities of each model.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>JCATS' training focus will include the strategic through tactical levels and will be an extremely effective tool for training, analysis, and mission planning and rehearsal. Among the unique capabilities to be provided by JCATS is very detailed modeling of small group tactics in rural or urban terrain and modeling day or night operations with artificial lighting. JCATS will also allow for dynamic aggregation and de-aggregation of units during the game allowing the user to play at the JTF level with larger numbers of entities with fewer players.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Weapon and platform characteristics, PH/PK data, terrain, force organization, and force orders and plans, graphic symbology</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>The user may modify all modeling data.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>formatted positional reports</li> <li>event history files, including movement, combat and attrition, logistics and intelligence information</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>not specified</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: Hewlett Packard 9000 Series 700 and/or the J series of UNIX workstations or Sun Solaris workstation suite.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>C and C++</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Refer to <b>Error! Bookmark not defined.</b></li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>not specified</li> </ul>

<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• initial databases may take several man-weeks</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified, but databases may be classified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• not specified</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Dept of Defense: US Army Europe (8 sites), Air Force Security Police Agency (50 sites), Special Operations Command (MacDill, &amp; Fort Bragg), Joint Warfighting Center, Pacific Command, US Marine Corps (Quantico), Southern Command, Marine Defense Zone Pacific (San Diego), 1 IN Div (Ft Riley), I Corps (Ft Lewis), National Simulation Center, Joint Readiness and Training Center.</li> <li>• Dept of Energy: Lawrence Livermore Nat'l Laboratory (Analytical Group and Safeguards &amp; Security), Sandia Laboratories (Analytical Group), and Savannah River (Safeguards and Securities).</li> <li>• Dept of Treasury: US Secret Service</li> </ul>
<b>MISCELLANEOUS:</b>	<p><i>Proposed enhancements for JCATS pending CCB approval:</i></p> <ul style="list-style-type: none"> <li>• Integration of Joint Functionality</li> <li>• Link with DISA's C4ISR model (Command, Control, Communications,</li> <li>• Computers, Intelligence Surveillance, and Reconnaissance)</li> <li>• Integration with COMPASS system</li> <li>• Link with the Joint Theater Level Simulation (JTLS)</li> </ul> <p><i>Other potential enhancements for JCATS are:</i></p> <ul style="list-style-type: none"> <li>• Integration of space capabilities</li> <li>• A crowd model and a traffic model which includes convoy capability</li> <li>• A language to input simple conditional tactics and doctrine to allow</li> <li>• Modification of rules of engagement</li> <li>• Integration with a detailed atmospheric model allowing weather modeling and the ability to simulate a chemical or biological release in a battlefield context</li> <li>• Terrain generation from satellite imagery and other available data sources</li> <li>• Enhanced logistics play</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Training model, attrition, logistics</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *LPXMED - EXTERNAL LOGISTICS PROCESSOR, MEDICAL MODULE*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Joint Staff/J4-Medical Readiness Division (MRD)</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Booz-Allen &amp; Hamilton, Inc.</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Joint Staff/J4-Medical Readiness Division (MRD)</li> <li>Telephone: DSN:223-5103/0510</li> <li>COM:(703) 697-0510</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The External Logistics Processor (LPX) Medical Module is a functional area simulation for the medical processes that occur within a theater of operations. It is intended to permit medical planners to make real-time decisions about the employment of medical support, test courses of action, assess the impact of force or asset shortages, and minimize the impact of logistics weaknesses.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>The External Logistics Processor (LPX) Medical Module is a functional area simulation for the medical processes that occur within a theater of operations. It is intended to permit medical planners to make real-time decisions about the employment of medical support, test courses of action, assess the impact of force or asset shortages, and minimize the impact of logistics weaknesses.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Casualty and Combat Unit data.</li> <li>Casualty arrival rates and intensities.</li> <li>Facility locations and configurations.</li> <li>Evacuation resources and routes.</li> <li>Facility staffing data.</li> <li>Facility supply data.</li> <li>The model can be run with default data for any or all elements</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Scenario parameters</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Medical facility utilization data to include staff, supplies, beds, evacuation, total.</li> <li>Evacuation route analysis.</li> <li>Casualty unit analysis.</li> <li>Shortfall reports.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Macro model / broad content limits capability for detail in specific areas and increases run time and platform required.</li> </ul>

<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer: IBM compatible PC, 386 min, 12MB RAM min.</li> <li>• Operating system: M&amp;S-DOS ver 5.0 or later with Microsoft Windows 3.1 or later.</li> <li>• Disk space: 10 MB.</li> <li>• Peripheral equipment: hard disk, printer.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• LPXMED simulation software.</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• LPXMED documentation is complete in one manual provided by the developer.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Joint Staff/J4-Medical Readiness Division (MRD)</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 30 minutes run time, CPU, per replication.</li> <li>• 2 man-days preparation of scenario input data.</li> <li>• 5 man-days analysis and evaluation.</li> <li>• 2 man-days learning time for user.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand (daily by some users)</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• CINC medical planners</li> <li>• Joint Staff</li> <li>• Services' Major Command medical planners.</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• In the process of being replaced by Medical Analysis Tool.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Analytical, Model, Theater, Logistics, Health Care, Computerized, Medical, Simulation, Scenario, Course of Action.</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• AMEDD Catalog of Computer Models</li> </ul>

**NAME OF MODEL:                      MARC-ES**

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Naval Medical Research &amp; Development Command</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Naval Health Research Center</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Paula Konoske, Ph D</li> <li>COM (619) 553-0730; DSN 553-0730; e-mail: <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>MARC-ES is a program for estimating clinical documentation storage requirements. It provides the user with a tool to estimate the space required to store medical data at each echelon of care for selected operational theaters.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>MARC-ES calculates storage requirements for a variety of scenarios using medical documentation requirements, casualty rates, and casualty flows.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Patient Condition rates for MRCE and MRCW</li> <li>Patient Flow</li> <li>Documentation requirements</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Class</li> <li>Echelon</li> <li>Theater</li> <li>Patient Condition</li> <li>Upload site</li> <li>Chip size</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Graphical and tabular reports projecting storage requirements for a deployable field medical device.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>None specified.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: 386DX/33MHZ or better processor; 486/66 MHZ recommended.</li> <li>Windows 3.1 or later</li> <li>4.0 MB minimum of free disk space for installation; with 8 to 16 MB memory recommended for running.</li> <li>VGA color display, Super VGA recommended.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Borland Delphi</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Konoske PJ &amp; Dobbins RW. A Computer Program for Estimating Medical Information Storage Requirements. Technical Document 96-6F, Naval Health Research Center.</li> <li>Konoske PJ, Dobbins RW &amp; Gauker ED. Marc-Es: a computer program for estimating medical information storage requirements. Military Medicine, 163, 1:049, 1998.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Not specified.</li> </ul>



<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"><li>• 5-10 minutes</li></ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"><li>• Unclassified, but some data files may be classified.</li></ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"><li>• Not known</li></ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• Medical planners and logisticians</li></ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• Model may be modified to estimate requirements for other storage technologies.</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• MARC, Medical documentation, MEDTAG, combat casualty care</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• Technical Document 96-6F, NHRC</li></ul>

**NAME OF MODEL:** *MAT - MEDICAL ANALYSIS TOOL*

<b>STATUS:</b>	
<b>PROPONENT:</b>	
<b>DEVELOPER:</b>	
<b>POINT OF CONTACT:</b>	
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The Medical Analysis Tool is both a Requirements Generator and a Course-of-Action analysis tool. Development of the MAT Requirements Generator has been expedited to fill the void created by the decision to turn off the legacy World Wide Military Command and Control System (WWMCCS), which includes the Medical Planning Module (MPM).</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>The underlying modeling methodology in the MAT Requirements Generator parallels the approach used in MPM. MAT uses an expected value model that determines requirements (primarily 'beds') by time period. Patient evacuation, treatment, and death from the previous period, together with new casualties, determine requirements for the current period. In general, this model represents the treatment and movement of patients through the medical system (the 'flow') day-by-day (or hour-by-hour).</li> <li>The underlying modeling methodology in the MAT Requirements Generator parallels the approach used in MPM. MAT uses an expected value model that determines requirements (primarily 'beds') by time period. Patient evacuation, treatment, and death from the previous period, together with new casualties, determine requirements for the current period. In general, this model represents the treatment and movement of patients through the medical system (the 'flow') day-by-day (or hour-by-hour).</li> </ul>
<b>FILE INPUT:</b>	
<b>USER INPUT:</b>	
<b>OUTPUT:</b>	
<b>MODEL LIMITATIONS:</b>	
<b>HARDWARE:</b>	
<b>SOFTWARE:</b>	
<b>DOCUMENTATION:</b>	
<b>VALIDATION &amp; VERIFICATION</b>	
<b>TIME REQUIREMENTS:</b>	

<b>SECURITY CLASSIFICATION:</b>	
<b>FREQUENCY OF USE:</b>	
<b>PRINCIPAL USERS:</b>	
<b>MISCELLANEOUS:</b>	
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	

**NAME OF MODEL:** *MEDEVAC - MEDICAL EVACUATION SIMULATION*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Assistant Commander for Force Integration, US Army Medical Department Center and School.</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Assistant Commander for Force Integration, US Army Medical Department Center and School.</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>US Army Medical Department Center and School Assistant Commander for Force Integration ATTN.: MCCS-FF Chief, Force Structure and Analysis Branch Fort Sam Houston, TX 78234-6175 Telephone DSN: 471-1746/2985; COM (210) 1746/2985</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The Medical Evacuation model is a computer simulation of patient movement from echelon I through echelon III of care in a theater of operations. It is used to provide insight and analysis capability on resource requirements and allocation methods for ground and air evacuation platforms to support a given patient workload.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>The model is a discrete event simulation of medical evacuation and patient movement within a theater of operations. Patients entering the health care system are identified with a patient condition code. Each patient is assigned attributes for each echelon of care based on their patient condition code. The attributes include the average length of stay, evacuation precedence, litter/ambulatory status, and if the patient will be returned to duty, evacuated to the next level of care, or dies-of-wounds. Primary solution techniques involve probability distributions of patient arrivals and patient types. Patient processing is simulated as a function of patient condition and evacuation resources available. The model includes animated displays of the simulation. Statistical summaries are available for resource utilization, casualty data, and workload. The model has options to specify and capture additional output which may be listed or used as input to other models.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Operational. (enroute times, patient workload, downtimes).</li> <li>Resources. (number evacuation platforms by type and location, number of crews to man the evacuation platforms by type and location).</li> <li>Medical Technology. (Patient priority, distributions, arrival rates, treatment delays and thresholds).</li> <li>Command and Control. (Rules for evacuation platform use, evacuation chain).</li> </ul>

<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• No user input.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Patient statistics for each level.</li> <li>• Evacuation platform use statistics.</li> <li>• Load configurations.</li> <li>• Statistics on thresholds exceeded.</li> <li>• Statistics from multiple replications.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• The only factor limiting the size of the model is the amount of RAM in your computer.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer: IBM compatible PC, 486 min, 8 MB RAM min (must be 8 MB extended memory).</li> <li>• 24 MB Permanent Swap File</li> <li>• Operating system: M&amp;S-DOS ver 5.0 or later.</li> <li>• Disk space: 25 MB.</li> <li>• VGA Monitor (640 x 480)</li> <li>• Peripheral equipment: hard disk, printer.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• MedModel simulation software, version 3.5 (COTS package).</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• MedModel documentation complete in two manuals. User and programmer/analyst documentation has not been developed.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Assistant Commander for Force Integration, US Army Medical Department Center and School.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 20 minutes run time, CPU.</li> <li>• 2 man-days preparation of scenario input data.</li> <li>• 5 man-days analysis and evaluation.</li> <li>• 5 man-days learning time for user.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Office of the Surgeon General, Department of the Army.</li> <li>• Director, Directorate of Combat and Doctrine Development, US Army Medical Dept. Center and School.</li> <li>• US Army Medical Department Center and School</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Operates independently. Long term objective to build connectivity to other medical models to simulate all or select portions of theater/battlefield</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Analytical, Model, Patient, Health Care, Evacuation, Ambulance, Helicopter, Medevac, Computerized, Stochastic, Medical, Simulation, Animation, Replications.</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• AMEDD Catalog of Computer Models</li> </ul>

**NAME OF MODEL:** *MEDiSim - SIMULATED MEDICAL CORPSMEN FOR MEDICAL FORCES PLANNING AND TRAINING*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Completed</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>DARPA</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>University of Pennsylvania, Medical College of Pennsylvania</li> <li>Naval Postgraduate School</li> <li>Sandia National Laboratories</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Dr. Norman Badler, Director Center for Human Modeling and Simulation University of Pennsylvania (215) 898-5862 or e-mail: badler@central.cis.upenn.edu</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The MediSim system extends virtual environments to represent simulated medical personnel interacting with simulated casualties to train medical corpsmen in initial casualty assessment, management, stabilization, and transport.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>MediSim is a prototype real-time injury assessment and management system for training military medics. MediSim uses Jack® human simulation software to simulate medical personnel interacting with casualties on a virtual battlefield. Medic trainees can use the system to examine and treat soldiers afflicted by various virtual injuries. Currently, the medic can 'perform' medical procedures either using an interactive, menu-driven interface or through suitable virtual reality (VR) equipment. Future work includes an artificial intelligence-based medical instructor to critique the performance of the trainee.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>None</li> <li>user input:</li> <li>Menu-driven commands to drive simulated medic to assess and treat virtual casualty</li> <li>Individual virtual environment interfaces</li> <li>Voice commands to simulated medical assistant</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Interactive simulation</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>None specified</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Silicon Graphics workstation</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>JACK® human simulation software</li> </ul>

<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Badler N.I. et al. MediSim: Simulated Medical Corpsmen and Casualties for Medical Forces Planning and Training. The National Forum: Military Telemedicine On-Line Today. Research, Practice and Opportunities. IEEE Computer Society Press, 1995.</li> <li>• Chi D.M. et al. Casualty Modeling for Real-Time Medical Training. PRESENCE: Teleoperators and Virtual Environments. Special Issue on the Human Figure in Virtual Environment Systems. In press.</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Not specified</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Not specified</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Not specified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• Intended for military medics</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• medical training, simulated casualties and medical corps, virtual environments, human models</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• <u>Error! Bookmark not defined.</u></li> </ul>
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	

**NAME OF MODEL:** *MEDTRAN MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Development completed</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• HQ USAFE/SG</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• BDM International, Inc., under contract to HQ USAFE/SG</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Col Lynn Duffany, +49-6371-47-7516</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• MedTran is a simulation of the aeromedical evacuation system. The model provides information about waiting times and costs for different system configurations of AE routes, aircraft types, and patient loads.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• The model simulates the allocation of resources (aircraft) to meet demand (patients needing transport) subject to system constraints (channel missions, rules on patient priorities). The model is a discrete-event simulation of a resource allocation/queuing problem.</li> <li>• The user interface is through a series of dialog boxes that allow the user to define objects (airfields, aircraft types, individual airplanes, and missions) as well as other system settings (run length, location of external files, etc.).</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Patient data is input through an external file created from a Defense Medical Regulating Information System (DMRIS) output file. The DMRIS file is manipulated through a series of automated database queries to produce the patient file.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Airfields, aircraft types, airplanes, missions, run length, location of external input and output files</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Summary report showing flying and crew duty hours, cost, special missions and waiting time data by patient movement priority</li> <li>• Detailed cost report by mission</li> <li>• Detailed workload (flying and crew duty hours) by mission</li> <li>• Report showing patient input data</li> <li>• Graphs showing time in transport and in system, customizable by patient movement priority and airfield</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Number of patients, airfields, missions, aircraft not limited by model</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• 486 PC (Pentium preferred), 8 Mb RAM (16 Mb preferred)</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Windows 95; Microsoft Access to create patient file (not required)</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Users Manual</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• In progress</li> </ul>



<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"><li>• HQ USAFE/SG and USAFE TPMRC</li></ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"><li>• HQ USAFE/SG, Ramstein AB, GE</li></ul>
<b>FREQUENCY OF USE:</b>	
<b>PRINCIPAL USERS:</b>	
<b>MISCELLANEOUS:</b>	
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	

<b>NAME OF MODEL:</b>	<b>MERLIN (MEDICAL READINESS LEARNING INITIATIVE)</b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Assistant Secretary of Defense for Reserve Affairs, in coordination with the Office of the Assistant Secretary of Defense for Health Affairs</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Uniformed Services University of the Health Sciences, in collaboration with the Henry M. Jackson Foundation for the Advancement of Military Medicine</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Dr. Eric B. Allely MD Henry M. Jackson Foundation for the Advancement of Military Medicine 1401 Rockville Pike Suite 600, Rockville MD 20852-1428 Phone (301) 424-0800 ext 1030 Email: &lt;allely@tekamah.com&gt;</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>MERLIN is part of a greater strategy called distance learning which attempts to leverage existing technology to get training curricula out to Active Components as well as to National Guard and Reserve members around the country and around the world.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>MERLIN is a computer-based simulation which provides realistic training for casualty management. It is an interactive readiness training program designed to improve triage skills and one's ability to work as a team member.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>MERLIN is a computer-based simulation which provides realistic training for casualty management. It is an interactive readiness training program designed to improve triage skills and one's ability to work as a team member.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Interactive responses at decision points in the patient care process.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Video and graphical presentations of patient conditions and treatment methodology, along with scoring and feedback on user performance.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>None specified</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Utilizes off-the-shelf computer equipment</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Easy access through the Internet and World Wide Web</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Executive Report: "MERLIN....Evaluation at Operation Arch Angel"</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>All medical data is SME approved. The evaluation of the software's training impact continues at live field exercises.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>A training session lasts from 4 to 6 hours.</li> </ul>

<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>Daily</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>Navy Corpsmen and buddy-system trainees</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>A cohort study conducted at Operation Arch Angel showed that the group trained on MERLIN showed a dramatic reduction in cycletime for casualty triage and stabilization.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>Medical training, corpsmen training, casualty care training, distance learning</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li><u>Error! Bookmark not defined.</u></li> </ul>

<b>NAME OF MODEL:</b>	<b>MOBCEM - MOBILIZATION CAPABILITIES EVALUATION MODEL</b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Operational</li> </ul>
<b>PROPOSER:</b>	<ul style="list-style-type: none"> <li>• US Army Concepts Analysis Agency</li> <li>• ATTN. CSCA_SS</li> <li>• 8120 Woodmont Ave., Bethesda MD 20814-2797</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• US Army Concepts Analysis Agency</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• John W. Warren, DSN 295-1690. COM (301) 295-1690</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• MOBCEM supports the analysis of current and projected Army (and eventually other services) mobilization capabilities and performance. This model will provide the capability to determine shortfalls in the mobilization system and examine the effects of potential changes in policies or resources.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• Domain: Mobilization, Readiness</li> <li>• Span: Mobilization levels up through full mobilization; typical model run will cover approximately 180 days.</li> <li>• Mission areas: Mobilization, training, base support</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• A list of deploying forces; individual flow rates of trainees, inductees, RT-8 etc.; Policy decisions on use of PWRS and logistics plans; mobilization stations; process rates/capabilities; equipment.</li> <li>• Input data is extracted from many standard data sources - TAEDP, SAMAS, TPFDD, PERSACS, TAPDB, CSM, MOBMAN, MPES, PROFIS</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Interactive preprocessor: analyst controls scenario parameters</li> <li>• Interactive postprocessor - report generation</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Standard reports, including casualty/injury/illness and medical utilization</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Intra-CONUS transportation and industrial base not simulated but represented through data inputs.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer system: SUN 4.260, 486 DX PC</li> <li>• Storage: To be determined</li> <li>• Peripherals: 8mm tape drive, CD-ROM</li> <li>• Network: PC-NFS for interface between SUN and PC</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Watcom sql, c++</li> <li>• Special system requirements: Borland C++ libraries</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Software Requirements Specification, Functional Description, Object Oriented Requirements Document</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Review of design documents by /MACOM</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• To be determined</li> </ul>

<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"><li>• Source Code: Unclassified. Data: Secret.</li></ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"><li>• Not specified</li></ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"><li>• CAA</li></ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"><li>• This is not a true medical model, but provides output that might be of interest to medical planners. The information listed herein was taken directly from the Web site below, and may not be current.</li></ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Mobilization, readiness, training, base support</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• <b>Error! Bookmark not defined.</b></li></ul>

<b>NAME OF MODEL:</b>	<b>AIR FORCE MEDICAL READINESS PLANNING FACTORS (MRPF)</b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Development completed.</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• USAF Surgeon General Office</li> <li>• Directorate, Medical Readiness Doctrine &amp; Planning</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• HQ USAF/SGXE (WAR-MED PSO)</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Col Sarah Wright, (301) 619-7503</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• The purpose of the Air Force Medical Readiness Planning Factors (MRPF) tool is to provide medical planners and programmers with an analytical mechanism to evaluate requirements, capabilities and assessments of the United States Air Force Medical Treatment Facilities (MTF). This analysis tool is critical to the planning and decision making which affects wartime medical capabilities, assessments, and requirements. A medical planning factors tool is essential for Air Force medical planners and programmers to determine service support needs in future conflicts. This MRPF tool was developed to satisfy those needs.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• The MRPF generates information based on a peak, ten day worse case scenario. Potential applications of this tool span the spectrum of planning and programming activities which support specific wartime medical missions.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Consists of a large database taken from the HQ USAF/SGXR Medical Readiness Support Database (MRSD), Defense Medical Standardization Board Deployable Medical Systems (DEPMEDS), USUHS Casualty Data Input for Air Base Medical System Modeling, HQ USAF/DPXC Threat Model, and HQ Air Mobility Command.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Population At Risk</li> <li>• Level of Care</li> <li>• Combat Intensity Level</li> <li>• Combat Intensity Period</li> <li>• WIA and DNBI Rates</li> <li>• Attack Data</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Patient Stream File</li> <li>• Attack File</li> <li>• Documentation File</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Battle Injury Casualties limited to those resulting from Air Delivered Conventional Weapons</li> <li>• Casualty Streams limited to DEPMEDS PCs</li> </ul>

<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• IBM Compatible PC with 486 or better processor</li> <li>• 90 Mhz</li> <li>• Hard Disc/Swap Minimum Space 20 MB</li> <li>• 8 MB RAM</li> <li>• VGA or Higher</li> <li>• Windows 95</li> <li>• 3.5" Floppy Drive</li> <li>• Mouse</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• MS Access and SQL</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• MRPF Reference Manual, including User's Instructions</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• V&amp;V Completed</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• </li> </ul>
<b>SECURITY CLASSIFICATION:</b>	
<b>FREQUENCY OF USE:</b>	
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• HQ USAF/SGXR, WAR-MED Planning Systems Office</li> </ul>
<b>MISCELLANEOUS:</b>	
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• HQ USAF/SGXE (WAR-MED PSO)</li> </ul>

**NAME OF MODEL:** *MEDICAL READINESS SUPPORT DATABASE (MRSD)*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Development Completed</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• USAF Surgeon General's Office</li> <li>• Directorate, Medical Readiness Doctrine and Planning</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• WAR-MED Planning Systems Office, HQ USAF/SGXR</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Col Sarah Wright, (301) 619-7503</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• Serves as a repository of AF Surgeon General medical readiness doctrine and clinical policy. Provides information for Standardized Medical Readiness Training System (SMRTS) at unit-level medical readiness training. Also, provides a variety of input files for simulation models.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• A system to provide easy access to view and modify any of the data used by war-med pso for activities relevant to policies, procedures, training, and simulation. The system consists of a database, application software, user interface, and several additional interfaces to allow easy transfer of information to and from MRSD.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Air Force Table of Allowances information, certain fields from DEPMEDS database</li> <li>• Files from the Network Editor</li> <li>• Expert panel data</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• User interface will allow database administrator to change all MRSD data, including data related to ConOps, Mission Statements, Base Operating Support, Work Center Data Description (Task &amp; Task description) for 72 Functional Account Codes, AFSC/task assignment lists, patient treatment networks, statistical modeling data.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Creates a variety of standardized reports for use by subject matter expert panels for data review and update. Reports can also be customized.</li> <li>• Extract to the Standardized Medical Readiness Training System</li> <li>• Files to the Network Editor</li> <li>• Extract to the simulation modeling database</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Some user training is needed to interact with the database.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Windows NT, 80 MG RAM, 4-10 GB Fast SCSI Hard Drive, EISA Architecture, PCI Bus</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• PowerBuilder 5.0, Sybase SQL Anywhere 5.0, multiuser version</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• MRSD Requirements and Design Specification</li> </ul>



<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• In progress</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Minimal</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• HQ USAF/SGXR WAR-MED PSO</li> <li>• Air Force MAJCOMS</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Fully integrated with Network Editor and UTC Validation Model (simulation).</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Database, War-Med, Air Force</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• WAR-MED PSO, Fort Detrick, MD</li> </ul>

**NAME OF MODEL:** *NAVAL HEALTH RESEARCH CENTER MARINE CORPS MEDICAL MATERIEL SUPPLY MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational. Medical tasks are defined, and supplies and equipment needed to perform those tasks have been identified for the following AMALs: <ul style="list-style-type: none"> <li>Corpsman medical vest</li> <li>Battalion Aid Station</li> <li>Lab</li> <li>X-ray</li> <li>Operating Room</li> <li>Surgical Shock Trauma (SST)</li> <li>Ward</li> </ul> </li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Marine Corps Combat Doctrine Development Center</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Code 22, Naval Health Research Center, San Diego, CA 92186-5122</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Dr. Paula Konoske, DSN 553-0730, COM (619) 553-0730; e-mail: <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>To model the far forward medical supply stream by linking specific clinical requirements to individual medical treatment items.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>This computer model produces medical consumable and equipment requirements for a given distribution of DEPMEDS patient conditions. The model produces an audit trail for each item in the Marine Corps supply system and provides a management tool for maintaining and updating supplies by linking the AMAL materiel with Marine Corps specific requirements.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>MRC East, MRC West, or user-defined</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Medical facility and logistics parameters; other inputs to be determined</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Marine Corps medical consumables and equipment</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>None specified.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: IBM-Compatible PC - 386 or higher.</li> <li>Storage: Minimum 25 MB disk space</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Windows 3.1 or higher</li> </ul>

<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Galarneau MR, Mahoney KJ, Konoske, PJ &amp; Emens-Hesslink KE. Development of a model for predicting medical supply requirements at the forward echelons of care: preliminary findings for echelon II laboratory and x-ray ancillaries. Naval Health Research Center Report No. 97-3, San Diego CA.</li> <li>• Galarneau MR, Konoske, PJ, Emens-Hesslink KE &amp; Gauker ED. A model for predicting medical supply requirements at the forward areas of care: battalion aid stations. Naval Health Research Center Report No. 97-28, San Diego CA.</li> <li>• Galarneau MR, Konoske, PJ, Emens-Hesslink KE &amp; Pang G. Reducing the logistical footprint of forward resuscitative surgical units using a patient-driven model of clinical events. Naval Health Research Center Report No. 98-1, San Diego CA.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Not specified</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Program setup: approximately 8 hours.</li> <li>• Program execution: approximately 30 minutes</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified, but some databases may be classified.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• To be determined</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Marine Corps medical planners and logisticians</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Additional efforts are underway to use this approach to examine existing AMALs/ADALs of shipboard medical departments.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• AMAL, medical supply modeling, medical resource planning, patient conditions (PCs)</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• Naval Health Research Center</li> </ul>

**NAME OF MODEL:**

**NETWORK EDIT**

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Development completed</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• USAF Surgeon General Office</li> <li>• Directorate, Medical Readiness Doctrine &amp; Planning</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• WAR-MED Planning Systems Office, HQ USAF/SGXR</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Col Sarah Wright, (301) 619-7503</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• Examine, validate, modify, and update patient condition sequential task networks for simulation in the UTC Validation Model.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• The Network Editor includes the Network Editor Application and the Network Editor Interface to the Medical Readiness Support Database (MRSD). It will extract, format, and display a graphical view of the master network of tasks for each DEPMEDS Patient Condition (PC) and for each echelon of care, including the Air Transportable Hospital (ATH). It will also allow viewing of individual PC networks, including PC-specific data attached to the tasks. It will support modifications to the networks, which will be exported to MRSD and stored in a format that can be used for simulation in the UTC Validation Model</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Files from MRSD are imported into the Network Editor. The files for the master network contain nodes representing tasks and logic and the links connecting the nodes. Files for the PC networks also include PC profiles with lists of active tasks and specifications of PC-specific task information.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Changes to nodes: task reference, sequence, or layout for viewing</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Revised networks and PC profiles</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• There are some limitations on the type of data that can be entered from the Network Editor rather than the standard MRSD user interface for database changes</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• PC with Pentium 133 Mhz, 17" Monitor</li> <li>• 64 MB RAM</li> <li>• 2 GB Hard drive,</li> <li>• HP Plotter</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Windows 95</li> <li>• NetViz</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Simulation Requirements and Design Specification Report</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• In progress</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• Minimal</li> </ul>

<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified, but some databases may be classified.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>On demand.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>HQ USAF/SGXR WAR-MED PSO and Air Force MAJCOMS</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>The Network Editor is intimately linked with two other models being developed and used by WAR-MED PSO: MRSD and the UTC Validation Model. Data files are extracted from MRSD for use in NetViz and stored there after changes are made. This ensures that the simulation will always reflect the most current network data. The master and PC networks are central to the UTC Validation Model, and the integrity of the networks is maintained through the Network Editor.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>War-med, Air Force, analysis, networks, nodes</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>War-Med PSO, Fort Detrick, MD</li> </ul>

**NAME OF MODEL:** ***OPTEVAC - THE OPTIMAL PLACEMENT OF CASUALTY EVACUATION ASSETS***

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Naval Medical Research &amp; Development Command</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Naval Health Research Center, Operations Research Division</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Christopher Blood, DSN 553-8386, COM (619) 553-8386</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The OPTEVAC model will provide medical planners with the required number and optimal placements of evacuation assets to ensure sufficient casualty transport while minimizing oversupply of ground and air ambulances.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>The OPTEVAC planning tool consists of input screens which employ graphical user interfaces prompting the user for the information needed for the simulations.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>The Probabilistic Location Set Covering Problem is the core module for a linear programming model which assists in the determination of evacuation assets determinations.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Theater, troop deployment nodes, types of evacuation assets available, and preferred locations of medical treatments facilities.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Tabular and graphic reports of requirements for ground and air ambulances as well as optimal positioning of those evacuation assets and ambulance exchange points.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>not specified</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Borland C++</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Naval Health Research Center Technical Report 97-7G</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>Evacuation assets, Casualty evacuation, Evacuation requirements</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>Naval Health Research Center Technical Report 95-39, 97-7G.</li> </ul>
<b>SOURCE OF INFORMATION:</b>	



**NAME OF MODEL:** *ORCA (OPERATIONAL REQUIREMENTS-BASED CASUALTY ASSESSMENT SOFTWARE SYSTEM)*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational (Alpha+ model)</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Joint Technical Coordinating Group/ Munitions Effectiveness &amp; Aircraft Survivability (JTCG/ME&amp;AS)</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>JTCG/ME&amp;AS Crew Casualty Working Group</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>David N. Neades, COM (410) 278-6335, DSN 298-6355, E-mail <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>To evaluate personnel casualties for all conventional insults (blast, burns, bullets, etc.), for any crew position (pilot, gunner, infantry, etc.), to support the analytical community consistent with the needs of the medical community.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>ORCA models personnel casualties by defining the component tasks required to perform an operational job and determining the effect of a given insult on individual capabilities as required for job performance .</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>ORCA uses a hierarchical database for job requirements:</li> <li>Job: MOS, NEC, AFSC, etc.</li> <li>Numbered Tasks</li> <li>Task Elements</li> <li>Databases and algorithms to model the physiological effects of insults and the relation between injury and individual capability</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Insult, individual characterization, and task requirements for MOS, NEC, or AFSC</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Graphical and tabular reports of operational casualty, individual capability, and injury summary</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Model is deterministic.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>UNIX operating system</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Alpha+ version of ORCA currently available.</li> <li>No proprietary software required.</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>User's Manual</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>In progress. Initial V&amp;V is underway for FY96. Scheduled for completion in FY 98.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>Minutes</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>Tri-Service vulnerability/lethality/survivability community</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>Available for testing. Completion scheduled FY98.</li> </ul>



<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• Casualty assessment, survivability, crew casualty</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• Dr. Terrence Klopac</li></ul>

**NAME OF MODEL:** *PATIENT WORKLOAD GENERATOR (PATGEN)*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Assistant Commander for Force Integration, US Army Medical Department Center and School</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Assistant Commander for Force Integration, US Army Medical Department Center and School</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>US Army Medical Department Center and School Assistant Commander for Force Integration ATTN: MCCS-FF Chief, Force Structure and Analysis Branch Fort Sam Houston, TX 78234-6175 Telephone: DSN: 471-1746/2985; COM (210) 1746/2985</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>The patient workload model generates a workload file of patient events to be used as input by other models. Summary statistical reports of patient movement through various echelons of the medical system are also produced.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>This model was originally a subroutine in the CZAR Model, which was developed to assess health care resource requirements in the combat zone and communications zone of a conventional theater. It is a stochastic model, which generates a workload of patients and summarizes their movement through various echelons of care until they leave the system. Patient movement, in the form of event notices, is a function of the stochastic variables and patient condition number. A statistical summary of the daily workload by patient condition is listed. The model has options to store other workload statistics in output files, which may be listed or used as input by other programs.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Incidence rates for disease and non-battle injury conditions, and probability of occurrence for wounded in action and battle fatigue conditions.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Troop strength of combat and support forces.</li> <li>Patient condition data such as treatment time and disposition category.</li> <li>Frequency of occurrence of categories by hour and day.</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Patient workload file with records of patient movement and final disposition.</li> <li>Summary report of patient workloads by day and patient condition for each treatment echelon.</li> <li>Summary reports of daily and periodic patient workloads by treatment echelon.</li> </ul>

<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Six treatment levels only.</li> <li>• Period length - maximum of 30 days.</li> <li>• Periods must have same length if they are to be aggregated.</li> <li>• Maximum of 5 regions per period.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer: Dual 486/66 MHz Processor.</li> <li>• Operating system: SCO UNIX.</li> <li>• Disk space: 20 MB.</li> <li>• Peripheral equipment: hard disk, printer.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Programming language: FORTRAN</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• User and programmer/analyst documentation is complete and contained in one manual. Includes: <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• File descriptions.</li> <li>• Run instructions.</li> <li>• Sample reports.</li> <li>• Flowcharts.</li> <li>• Subroutine descriptions.</li> <li>• File printouts.</li> <li>• Common block dictionary.</li> </ul> </li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Assistant Commander for Force Integration, US Army Medical Department Center and School</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• man-weeks learning time for user.</li> <li>• man-days preparation of scenario input data</li> <li>• man-days analysis and evaluation.</li> <li>• seconds run time</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Assistant Commander for Force Integration, U. S. Army Medical Department Center and School</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Workload, Model, Health Care, Generator, Events, Patients, FORTRAN, Stochastic.</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• AMEDD Catalog of Computer Models</li> </ul>

<b>NAME OF MODEL:</b>	<b>PATIENT FLOW MODEL (PFM)</b>
<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• Director, U.S. Army Concepts Analysis Agency</li> <li>• ATTN: CSCA-SS, 8120 Woodmont</li> <li>• Avenue, Bethesda, MD 20814-2797.</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• US Army Concepts Analysis Agency</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Stanley Miller</li> <li>• COM (301) 295-5292; DSN 295-5292</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• The Patient Flow Model is a computerized analytical tool which tracks hospitalized patients in a theater and the sustaining base. The flow of patients through two to four echelons can be simulated, with strengths admission rates, echelon skip policies, and dispersion factors. Forecasts of hospital bed requirements and patient evacuation requirements by echelon, plus the impact upon the CONUS hospitalization system of admissions evacuated from the theater are also evaluated. The model can be used to evaluate effects of changes in evacuation policy, changes or use of a skip policy, and sensitivity of any assumptions concerning input variables</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• The model is a one-sided deterministic, time-step, patient flow analyzer for theater level forces. The smallest group is usually a division, but other unique combat elements can be separately analyzed. Primary solution techniques involve probability distributions of patient accumulation and dispositions. An alternative version is available which computes the supportable evacuation policy for a given number of theater hospital beds.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Wounded, disease and non-battle injury admission rates by region by time period</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Dispersion factors.</li> <li>• Number of time periods.</li> <li>• Length of periods.</li> <li>• Number of echelons.</li> <li>• Number of regions per echelon.</li> <li>• Number of divisions.</li> <li>• Evacuation and skip policies.</li> <li>• Evacuation delay.</li> <li>• Number of theater beds.</li> <li>• Troop strengths by region by time period.</li> </ul>

<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Admission summary by echelon.</li> <li>• Patient flows and status at each time period in each echelon (bed requirements, evacuees, deaths, discharges, skipped evacuees).</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Maximum of 24 time periods.</li> <li>• Total days not to exceed 360.</li> <li>• Four echelons; eight regions each.</li> <li>• Two-day minimum time period.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer: IBM compatible PC, 4MB RAM min.</li> <li>• Operating system: M&amp;S-DOS.</li> <li>• Disk space: 700K.</li> <li>• Peripheral equipment: hard disk, printer.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Programming language: M&amp;S-FORTRAN.</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Complete in one manual with narratives, flowchart, program listing, and input formats. Data base probability distributions are also included. User documentation is limited.</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Not provided</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 2-5 seconds run time.</li> <li>• 1 man-day to analyze and evaluate results.</li> <li>• 1 man-day to structure non-critical data in model input format.</li> <li>• 1 man-week learning time for users.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Office of the Surgeon General, Department of the Army.</li> <li>• Concepts Analysis Agency.</li> <li>• Directorate of Combat and Doctrine Development.</li> <li>• US Army Medical Department Center and School.</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Operates independently or in connection with other medical or nonmedical programs.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Analytical, Model, Patient, Flow, Health Care, Computerized, Deterministic, Time Step, Medical, FORTRAN</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• AMEDD Catalog of Computer Models</li> </ul>

**NAME OF MODEL:** *SHIPCAS - SHIPBOARD CASUALTY PROJECTION SYSTEM*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Naval Medical Research &amp; Development Command</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>Naval Health Research Center</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Christopher Blood, DSN 553-8386, COM (619) 553-8386</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>SHIPCAS provides medical planners with injury and illness estimates.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Parameters of naval combat operations such as hit rates and battle intensity were statistically determined for both combatant and auxiliary ships under fire from several different weapon types. SHIPCAS incorporates these rates into a user-defined naval combat scenario to estimate resulting casualties.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>SHIPCAS file which incorporates data from 80 naval combat operations</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Ship selection - user specifies composition of task force.                             <ul style="list-style-type: none"> <li>Combatant (destroyers, carriers, frigates, or cruisers)</li> <li>Auxiliary (cargo, minesweeper, motor torpedo, tank landing ship, or transports)</li> <li>Battle Intensity (none, light, moderate, high, or intense) and duration.</li> </ul> </li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Hit distribution tables, casualty distribution tables, DNBI, WIA, and graphics</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Not specified</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: IBM or IBM-compatible PC</li> <li>Storage: 1 MB RAM, 2 MB free space on hard disk</li> <li>Peripherals: EGA, VGA, or SVGA monitor, serial mouse</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>DOS version 4.01 or higher</li> <li>Microsoft Windows 3.1 or higher</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Technical Document 94-6F, Naval Health Research Center</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Technical Document 97-3C, Naval Health Research Center</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>Not specified</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>Not specified</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li></li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>Casualty estimate, Illness estimate, Injury estimate</li> </ul>

<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• Technical Document 97-3C, Naval Health Research Center</li></ul>
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**NAME OF MODEL:** *SHIPDAM - SHIP DAMAGE MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>Wargaming Department, Naval War College</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>John David Taylor Laboratory</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Harry Gray, e-mail address: <b>Error! Bookmark not defined.</b></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>SHIPDAM models ship damage caused by weapons hits. It is designed to support battle damage assessment in conjunction with larger war games or other micromodels.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: Sea</li> <li>Span: Local</li> <li>Force composition: Individual ship, enemy antiship weapons</li> <li>Scope of conflict: Conventional antiship weapons</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Data sets for ship classes, developed by David Taylor</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>User defines target ship, type, and number of impacting weapons, and azimuth of weapon approach</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Data files containing exact burst point location for each hit, status for ship components and systems, and hit-by-hit report</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Can only be run for ship classes for which David Taylor Research Center has constructed data sets.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: IBM-compatible PC with 512K RAM</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>C</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>User's manual, source code</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>not specified</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>Data Base: 10 minutes</li> <li>CPU time: 20 seconds</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified, but databases are classified.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>Several times per year</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>Wargaming Department, Naval War College</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>SHIPDAM is not a medical model, but provides output that might be of interest to medical planners.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>model, attrition, damage assessment</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li><b>Error! Bookmark not defined.</b></li> </ul>



**NAME OF MODEL:** *STANDARDIZED MEDICAL READINESS SYSTEM (SMRTS)*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Development Completed.</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>USAF Surgeon General Office</li> <li>Directorate, Medical Readiness Doctrine and Planning</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>WAR-MED Planning Systems Office, HQ USAF/SGXR</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Col Sara Wright (301) 619-7503</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>To develop specialty specific and mission specific medical readiness training at unit level.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>An informational database of medical readiness training tasks for each Air Force AFSC. Information is queried by Functional Account Code (FAC) and by Echelon.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Work Center Description Database</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Series of reports to assist in creating training plans. FAC Echelon AFSC Specific Report, FAC Team Training Report, Mission-Concept of Operations Report, Echelon Specific Report, Echelon-AFSC Specific Report</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer: 386 or higher</li> <li>Monitor: VGA or higher</li> <li>Minimum disk space: 20 Mbytes</li> <li>RAM: 8 MB</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>WINDOWS 3.1 or higher</li> <li>Power Builder 5.0</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>Source code</li> <li>Users manual</li> <li>Technical/Specifications Document</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>TBA</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>5-10 minutes</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>HQ USAF/SGXR WAR-MED PSO</li> <li>Air Force MAJCOMS</li> <li>AF Active Duty, Reserve, and Guard facilities and units</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>Operates independently, with a long-term objective of building connectivity to Defense Medical Human Resources System (DMHRS).</li> </ul>

<b>KEYWORDS:</b>	<ul style="list-style-type: none"><li>• War-Med, Air Force, model, FAC, AFSC, echelon</li></ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"><li>• USAF WAR-MED PSO, Fort Detrick, MD</li></ul>

**NAME OF MODEL:** *THREAT RELATED ATTRITION (THREAT) SYSTEM*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• FOC 31 Oct 97. Software now in maintenance phase.</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• HQ USAF DCS/Personnel, Air Force Contingency and Joint Matters Division (HQ USAF/DPXC)</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• Maj Richard B. Berry, COM (703) 695-0735, DSN 225-0735</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Single Agency Manager, Air Force Pentagon Communications Agency, Air Staff Systems Directorate, Management Information Systems Division</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• The THREAT system generates personnel attrition rate estimates based on wartime scenarios for use by air staff planners to support requirements of the War Mobilization Plan (WMP-1) and the Joint Operational Planning and Execution System (JOPES).</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• THREAT is a software system composed of three Computer Software Configuration Items (CSCIs); the Executive, the Casualty Generation Model (CGM), and the Facility Model.</li> <li>• The Executive CSCI controls all user input to the THREAT system, allows execution of the FM and CGM models, and allows viewing of results of model executions.</li> <li>• The FM provides casualty estimates of one weapon against one structure type.</li> <li>• The CGM CSCI produces casualty estimates for an entire installation and combines installation estimates for an entire theater.</li> <li>• Weapons used include conventional, nuclear, chemical, biological, and SOF forces.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• Structure Data</li> <li>• Weapon Data</li> <li>• Weapon Effect Data</li> <li>• Disease Non-battle Injury (DNBI) Data</li> </ul>

<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• Scenario Data</li> <li>• Administrative Loss Rates</li> <li>• Air War Loss Rates</li> <li>• Blue Airbase Description</li> <li>• Blue Sortie Type Descriptions</li> <li>• Blue Air Missions</li> <li>• Building Populations</li> <li>• Personnel Categories</li> <li>• Personnel Placement Rules</li> <li>• Red Airbase Descriptions</li> <li>• Red Sortie Type Descriptions</li> <li>• Stick Type Descriptions</li> <li>• Time Phased Force deployment Data</li> <li>• DNBI Wartime Multipliers Override Data</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Battle Injury Attrition</li> <li>• Air Mission Attrition</li> <li>• DNBI Attrition</li> <li>• Combat Stress Attrition</li> <li>• Daily Attrition rates by Theater</li> <li>• Daily Attrition Rates by Occupational Group</li> <li>• Attack Casualties by Airbase and Day</li> <li>• Facility Model Detailed Report</li> <li>• Facility Model Summary Report</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Provides only Attrition Data</li> <li>• Limited to USAF Structure Types</li> <li>• Requires Qualified Operations Analyst</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Sun Sparc 5 Computer System</li> <li>• Internal Disk Drive : 2 MB</li> <li>• Internal Floppy Drive : Capable of running X windows</li> <li>• Color Workstation: Compatible with the Sun Sparc 5</li> <li>• Key Board : Compatible with the Sun Sparc 5</li> <li>• Desktop Sun CD Pack: 644 MB</li> <li>• Desktop Backup Pack: 5 Gigabyte; 8mm Tape</li> <li>• Printer: Post Script level 2 Compatible</li> <li>• Digitizer: GTCO Corporation Roll-UPII</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Solaris 2.3: Operating System for Sun Sparc 5</li> <li>• Sybase SQL server 10.0.2: THREAT database management system</li> <li>• Sybase Open Client C 10.0.2</li> <li>• Sybase Open Client Ada 10.0.2</li> <li>• Sybase Open Client Server 10.0.2</li> <li>• Minor Utilities: Unix ® shell scripts, SciLab*, and SQL scripts will be used for initialization of test data and verification of test results.</li> </ul>

<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• THREAT System Facility Model Technical Reference Manual</li> <li>• THREAT System Casualty Generation Model Technical Reference Manual</li> <li>• THREAT System Facility Model Computer Software Configuration Item (CSCI) Software Product Specification</li> <li>• THREAT System, Casualty Generation Model CSCI Software Product Specification</li> <li>• THREAT System Executive CSCI Software Product Specification</li> <li>• THREAT System Interface Design Document</li> <li>• THREAT System Software User's Manual</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Verification testing of the IOC version has been successfully completed. A significant amount of Validation testing of the IOC version has been accomplished but not fully completed.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• As required</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Unclassified, but some databases may be classified.</li> <li>• THREAT contains technical data whose export is restricted by the Arms Control Act (Title 22, U.S.C. Sec 2751, et. seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App. 2401, et. seq.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• On demand</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• HQ USAF/DPXC</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• Written in Ada for the most part. Uses C+ for some code.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Personnel Attrition, Casualties, Modeling, Operations Analysis, Personnel Planning</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• AF/DPXC</li> <li>• SAM/GADB</li> <li>• SAM/GADC</li> </ul>

**NAME OF MODEL:** *TRANSMO - TRANSPORTATION MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>Operational</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>US Army Concepts Analysis Agency</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>John W. Warren, DSN 295-1690, COM (301)295-1690</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>TRANSMO is used primarily to analyze strategic deployment issues taken in the context of the Defense Guidance Illustrative Planning Scenario. It specifically simulates the loading of cargo on intertheater lift vehicles, ultimately resulting in an arrival sequence of cargo in the theater of operation.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: Deployment, redeployment, sea, air</li> <li>Span: Accommodates any theater depending on database input.</li> <li>Mission area: Mobility</li> <li>Level of detail: Processes on an hourly basis for aircraft and a daily basis for sealift. Lift assets are represented by their speed and capacities.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Major Regional Contingency (MRC) East, MRC West, Nearly-simultaneous (NS) East-West, and NS West-East. Humanitarian assistance, peace enforcement, peacekeeping, and lesser regional contingency databases representing Army requirements.</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Scenario data, including lift asset factors, distances between ports</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Printouts of movement requirements, attrition associated with each requirement, and arrival time at the POD.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>Does not track specific commodities and individual lift assets.</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>Computer system: UNIX workstation</li> <li>Storage: 80,000 blocks (40 MB) for the model only</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>Fortran</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>User's Manual</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>Strategic Mobility System Assessment Study, Sept. 1986, CAA-SR-86-25, USACAA</li> <li>Strategic Deployment Analysis Review Study, Dec. 1991, CAA-SR-91-13, USACAA</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>1 week to prepare full scenario</li> <li>20 minutes CPU time</li> <li>2-3 hours to analyze typical run</li> </ul>

<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Source code: Unclassified</li> <li>• Data: Secret</li> <li>• Documentation: Unclassified</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• Not specified</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• US Army Concepts Analysis Agency</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• This is not a true medical model, but provides output that might be of interest to medical planners. The information listed herein was taken directly from the Web site below, and may not be current.</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• Simulation, attrition, scenario</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• <b>Error! Bookmark not defined.</b></li> </ul>

**NAME OF MODEL:** *UTC (UNIT TYPE CODE) VALIDATION MODEL*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Development completed</li> </ul>
<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>• USAF Surgeon General Office</li> <li>• Directorate, Medical Readiness Doctrine &amp; Planning</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>• WAR-MED Planning Systems Office, HQ USAF/SGXR</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>• Col Sarah Wright, (301) 619-7503</li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• A family of simulation models for Air Force Unit Type Codes (UTC). Models validate UTC's, help determine correct number and skill mix of personnel, and sufficient amounts of critical medical equipment to treat user selected casualty streams. Allows analysis of AFSC utilization, bed utilization, length of waiting time, queues, and patient dispositions i.e. return to duty, died of wound, evacuated, and AE requirements.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>• The UTC Validation Model simulates hospital layout, flow of staff and patients through the hospital, patient tasks as determined by patient condition and dynamic conditions within the hospital, and staff and equipment utilization. It uses established task performance times and incorporates logic regarding alternative routings when preferred routings are not available, time on wards prior to evacuation or return to duty, timing of patient deaths, treatment priorities, surgery scheduling, group ward tasks, and selection of treatment providers.</li> <li>• The user interface to the simulation is provided through a preprocessor unit, which extracts baseline data from the Medical Readiness Support Database (MRSD) and operates on the data to make it suitable for use in the simulation. Through the interface, the analyst can enter data to control the simulation, such as hospital configuration, staffing requirements, and equipment availability. Data from other sources, such as input casualty streams, also are read into the preprocessor and transformed for use in the simulation. The preprocessor maintains a history of runs and associated versions of the data.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>• An extract from MRSD is imported into the preprocessor; the extract includes information on WCD tasks (equipment, task times, and AF specialty codes), patient conditions (active tasks and task parameters), and master network</li> <li>• Casualty streams are imported into the preprocessor</li> <li>• Flat files from the preprocessor are imported into the simulation</li> </ul>



<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>• UTC configuration, staffing, equipment, and casualty stream (through the preprocessor interface)</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>• Statistics reporting on input from the preprocessor (conditions and categories of casualties entering the ATH, staffing, configuration)</li> <li>• Statistics reporting on output from the simulation (resource, equipment, and bed utilization; patient outcomes)</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>• Currently limited to 30 days and 1,500 patients</li> <li>• Requires trained analyst to select input parameters and interpret results (entering information and conducting the simulation is not a limitation)</li> </ul>
<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Minimum: PC with Pentium 133 MHz, 64 MB RAM, 2 GB Hard drive</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• Windows 95, MedModel Version 3.2</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Simulation Uncertain Requirements and Design Specification Report</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• In progressUnclassified, but some databases may be classified.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• On demand.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• HQ USAF/SGXR WAR-MED PSO</li> <li>• Air Force MAJCOMS</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• The UTC Validation Model is intimately linked with two other models being developed and used by WAR-MED PSO: MRSD and the Network Editor. The data link to MRSD ensures that the simulation can be run to reflect the most current task and patient data. The connection with the Network Editor is that the master and PC networks are central to defining a patient's path through the ATH, and the integrity of those networks is maintained through the Editor.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• War-Med, Air Force, model, treatment, networks, planning, scenario, simulation, staffing</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>• WAR-MED PSO, Fort Detrick, MD</li> </ul>
<b>KEYWORDS:</b>	
<b>SOURCE OF INFORMATION:</b>	

**NAME OF MODEL:** *VIC - VECTOR IN COMMANDER*

<b>STATUS:</b>	<ul style="list-style-type: none"> <li>• Operational since 1985</li> </ul>
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<b>PROPONENT:</b>	<ul style="list-style-type: none"> <li>US Army TRADOC Analysis Center, ATTN.: ATRC-FM, Fort Leavenworth KS 66027</li> </ul>
<b>DEVELOPER:</b>	<ul style="list-style-type: none"> <li>US Army TRADOC Analysis Center</li> </ul>
<b>POINT OF CONTACT:</b>	<ul style="list-style-type: none"> <li>Mr. Dick Calkins, DSN 552-9255, COM (913) 684-9255</li> <li>E-mail: <u>Error! Bookmark not defined.</u></li> <li>Web Site: <u>Error! Bookmark not defined.</u></li> </ul>
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>VIC's primary role is the development of TRADOC standard low-resolution scenarios and the conduct of combined arms analysis on doctrine, force structure, operational concepts, and COEA/AOA's. The outcome of force interactions is determined in terms of the ground gained or lost, the attrition of personnel and weapon systems, CSS/CS ability to support the battle, and C4ISR collection and dissemination capabilities.</li> </ul>
<b>GENERAL DESCRIPTION:</b>	<ul style="list-style-type: none"> <li>Domain: Land, air, space (overhead to land)</li> <li>Two sided, deterministic, discreet event simulation</li> <li>Joint operations as they relate to supporting the maneuver battle</li> <li>Span: Accommodates any theater depending on data base</li> <li>Mission areas: All conventional missions to include NBC.</li> <li>Level of detail: Maneuver units at the company or battalion level and support elements at the battery, squad, and individual platform level.</li> </ul>
<b>FILE INPUT:</b>	<ul style="list-style-type: none"> <li>Available Databases/scenarios: Europe, SWA, NEA</li> <li>Basic weapons performance data, other system performance data, tactical decision rules</li> </ul>
<b>USER INPUT:</b>	<ul style="list-style-type: none"> <li>Forces and supply inventories, geographic and terrain data, intelligence characteristics and capabilities, lines of communication, engineer capabilities, and air and air defense capabilities</li> </ul>
<b>OUTPUT:</b>	<ul style="list-style-type: none"> <li>Casualties and systems losses, FLOT traces and force positions over time, target acquisition and intelligence summaries, availability and condition of forces and supplies, and air battle and air defense results, situation reports, and command and control decisions made.</li> <li>All functional &amp; operational output is saved as comma-delimited flat files for use by standard relational database software products.</li> </ul>
<b>MODEL LIMITATIONS:</b>	<ul style="list-style-type: none"> <li>not specified</li> </ul>

<b>HARDWARE:</b>	<ul style="list-style-type: none"> <li>• Computer system: SUN, HP, Silicon Graphics</li> <li>• Memory: 128+ mb RAM</li> <li>• Storage: Minimum 500 mb required.</li> <li>• Network requirements: Aggregate Level Simulation Protocol (ALSP) for DIS applications as required.</li> </ul>
<b>SOFTWARE:</b>	<ul style="list-style-type: none"> <li>• SIM&amp;SCRIPT</li> </ul>
<b>DOCUMENTATION:</b>	<ul style="list-style-type: none"> <li>• Executive Summary, User Manual, Programmer Manual, Data Input Guide, Methodology Descriptions</li> </ul>
<b>VALIDATION &amp; VERIFICATION</b>	<ul style="list-style-type: none"> <li>• Study proponent validates and certifies VIC's use for their specific application using detailed reviews "peelbacks" by schools and centers in conjunction with TRAC.</li> </ul>
<b>TIME REQUIREMENTS:</b>	<ul style="list-style-type: none"> <li>• 1 to 3 months to prepare database depending on data availability and scenario.</li> </ul>
<b>SECURITY CLASSIFICATION:</b>	<ul style="list-style-type: none"> <li>• Source code and documentation: Unclassified.</li> <li>• Databases are often classified.</li> </ul>
<b>FREQUENCY OF USE:</b>	<ul style="list-style-type: none"> <li>• As the Army's principle Corps-level simulation for force-on-force analysis, VIC is in constant use.</li> </ul>
<b>PRINCIPAL USERS:</b>	<ul style="list-style-type: none"> <li>• Available to DOD agencies by written request.</li> <li>• TRAC, OSD-PA&amp;E, MCCDC, TRADOC Schools &amp; Centers, various Contractors</li> </ul>
<b>MISCELLANEOUS:</b>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>KEYWORDS:</b>	<ul style="list-style-type: none"> <li>• simulation, model, analysis, force-on-force, C4ISR</li> </ul>
<b>SOURCE OF INFORMATION:</b>	<ul style="list-style-type: none"> <li>• Web Site: <u>Error! Bookmark not defined.</u></li> </ul>